

EXAMINER'S GUIDE

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EXAMINER'S GUIDE

FOR

PSYCHOLOGICAL EXAMINING IN THE ARMY

Prepared especially for military use by the Subcommittee on Methods of Examining Recruits of the Psychology Committee of the National Research Council



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I.—INTRODUCTORY STATEMENT.

1. PURPOSES OF PSYCHOLOGICAL EXAMINATION.

(a) To classify soldiers according to their mental ability, thus supplementing personnel records of occupational qualifications and assisting with assignment in the Army.

(b) To supply a mental rating for each soldier which shall assist personnel officers in building organizations of equal or of appropriate mental strength.

(c) To assist regimental, company and medical officers by careful examination and report on men who are not responding satisfactorily to training, or are otherwise troublesome.

(d) To assist officers of development battalion with classification, grading, training, and ultimate assignment of men.

(e) To assist in discovering men of superior mental ability who should be selected for officers' training camps, for promotion or for assignment to special tasks.

(f) To assist in discovering and properly placing men of marked special skill, as for example, observers or scouts for intelligence service.

(g) To assist in discovering men who are mentally inferior and who in accordance with degree of defectiveness should be recommended for discharge, development battalions, labor organizations or regular military training.

2. GENERAL PLAN OF EXAMINATION.

(1) Segregation of men obviously illiterate.

(2) Group examination Alpha (for literates):

Time, 40 to 50 minutes.

Number, 100 to 200 men in a group.

(3) Group examination Beta (for illiterates and men failing in examination Alpha):

Time, 50 to 60 minutes.

Number, up to 60 men in a group.

(4) Individual examinations (for men failing in Beta, or referred):

Point-scale examination.

Stanford-Binet examination.

Performance-scale examination.

Time, 15 to 60 minutes.

Mechanical skill examination (supplementary):

Time, 15 to 30 minutes.

The order of procedure is as follows:

(a) A group consisting of 100 to 200 men will report to the psychological examiner at designated room for examination Alpha.

(b) Men who can not read and write English at all should first be eliminated from this group by directing those who can not read or write to stand, and by observing the manner in which the remainder fill out the headings of the examination Alpha blank. Those who are eliminated should be sent to the special Beta examining room; the remainder should be given examination Alpha.

(c) Men found later to have made scores of less than 15 (raw score) in examination Alpha should be given examination Beta.

(d) Individuals rated D— after Beta or after Alpha and Beta will report by appointment for individual examination. It is estimated that not over 5 per cent of the strength of an organization should require individual psychological examination.

Summary.—All enlisted men take either Alpha or Beta. Those who can read and write English, take Alpha immediately. Those who can not, take Beta immediately. Those who make scores of less than 15 in Alpha take Beta. All who fail in Beta take individual examination. The form of individual examination given varies with the characteristics of the subject. Point-scale or Stanford-Binet examination may be given to subjects who are able to understand English fairly well. To all other subjects performance-scale examination should be given either alone or in addition to one of the other scales.

3. ORGANIZATION AND ROUTINE.

The value of these examinations will depend upon the perfection of organization and the efficiency of the routine procedure which is developed by the examining staff. The following points are especially important:

(a) Previous arrangement should insure the prompt reporting of men either by groups or individually at a given time and place for prescribed examination. Company officers accompanying groups to be examined, should be asked to list men who give trouble, or whom they would like to see examined individually; reasons and company record should be noted in each case.

(b) Group and individual examination blanks should be scored and recorded as promptly as possible, and ratings prepared for immediate report. The chief psychological examiner is responsible for one complete file of all examinations, to be kept in easily accessible form by organizations. All available lists of names, such as company rosters, personnel officer lists, etc., should be used by examiners to simplify and to increase the accuracy of the reports. Time will often be saved by typing or writing scores directly on such lists, especially if they can be obtained in duplicate or triplicate.

(c) The intelligence rating of every man examined should be reported promptly to Personnel Officer, with comment concerning any special aptitude noted. Company commanders should also have all available information as soon as men are assigned.

(d) All cases of mental deficiency, as well as all cases for which neuro-psychiatric examination is especially indicated, should be referred promptly to the psychiatrist through the camp or division surgeon. Complete report of psychological examination, on blank furnished for the purpose, must accompany every such case, whether

referred for discharge, assignment to special organization, or neuro-psychiatric examination.

(e) Psychological record card, complete with recommendation and disposition of case, and report on cases recommended for neuro-psychiatric examination should be forwarded to the Surgeon General's Office, Division of Psychology, after the soldier has left camp.

(f) Weekly statistical sheet should be sent promptly on or before Tuesday of each week to Surgeon General's Office. It should be supplemented by such letter statements and special reports as seem desirable.

(g) Every effort should be made to cooperate as fully and effectively as possible with all officers of the camp or division for the increased efficiency of the Army.

February 2, 1918, the following instructions were issued, by the divisions concerned, to promote cooperation and increase the efficiency of the psychological and neuro-psychiatric services:

PROVISION FOR COORDINATION OF PSYCHIATRIC AND PSYCHOLOGICAL EXAMINATIONS
IN DIVISIONAL TRAINING CAMPS.

It is agreed between the Division of Psychology and the Division of Neuro-psychiatry:

(1) That psychiatric survey of organizations shall be made in conjunction with psychological survey.

(2) That for this purpose psychiatric examiners shall be present at group psychological examinations, to observe the behavior and appearance of soldiers. It is further provided that the work of the psychiatrist shall not interfere with the proper conduct of psychological examination.

(3) That rooms numbered 5 and 6 in Psychology Building shall be designated for psychiatric examining.

(4) That the name, rank, and organization of individuals receiving grade E in group psychological examination shall be reported promptly to the division psychiatrist through the division surgeon.

(5) That report of individual psychological examination shall be accepted by psychiatrist as part of the medical examination and shall be included in the case record if subject be recommended for discharge or for special assignment.

PEARCE BAILEY,

Major, M. R. C., Chief of Division of Neuro-psychiatry.

ROBERT M. YERKES.

Major, S. C. N. A., Chief of Division of Psychology.

4. UTILIZATION OF RESULTS.

Psychological ratings should be valuable alike to personnel officers, line officers, and medical officers. To the first, as partial basis for placement of soldiers; to the second, as supplementary information for guidance in connection with training, or special treatment of men who give trouble; and to the third, as partial basis for recommendation for discharge, special examination, or medical treatment.

The results of examination should be made available to these officers as early as possible. It is therefore the duty of the psychological examiner to see that every drafted man is examined as promptly as possible after arrival in camp, and that report is immediately made to the personnel officer, to the medical officer if the case requires it, and subsequently to the company commander to whom the man is assigned.

The draft contains an adequate number of high-grade men to fill positions of responsibility. The psychological examination helps

to reveal noncommissioned officer material and suitable candidates for officers' training camps. It also supplies partial basis for assignment of men to specific trades or occupations in the Army. In making selections for training in any specialized branch of military service it will probably be wise to select individuals whose intelligence scores are well above the lower quartile for the occupation in question. Apart from inequalities in experience or special training, the difference in the scores of two men will, in a general way, indicate their relative value for assignment to a specific trade or occupation.

Emphasis should be placed upon the desirability of balancing the special trades and occupations in the various companies and regiments. Each unit should have its proper share of high, medium, and low grade men for special assignments as well as for the ranks. It is evident that the ultimate value of the psychological service in balancing the units will depend very largely upon the establishment of proper cooperative relations with personnel officers. Frequent conferences with the personnel officers should be held, and ways and means considered for securing effective coordination of effort.

To be of the greatest value the psychological examination should be given at the earliest possible date after the arrival of the men in camp, in order that the personnel officer may have the results on the qualification cards when making assignments. Unless the scores are available and used properly at this time, companies will be built up that are very uneven in general intelligence. In order to balance companies and regiments satisfactorily it is necessary to observe not only the special requirements laid down in the tables of organization, but also the requirement that there shall be equivalent grades of intelligence in company organizations and in the various trades and occupations demanded in each.

Cooperative relations should be established between psychiatrists and psychological examiners in order that company commanders and personnel officers may obtain promptly detailed information concerning any individual recruit. The lower grades of mental capacity are clearly indicated by the Alpha and Beta examinations. The lowest cases should be given individual examination with the least possible delay. Company commanders should be encouraged to refer for examination men whose drill or conduct is unsatisfactory. Where development battalions have been formed special study should be made of the results of the development work in the case of men of various grades of intelligence. The psychological service should be able to make an effective contribution in the handling of development units.

5. CONFERENCES WITH OFFICERS.

In order that the results of examinations may be used effectively, it is necessary that psychological examiners take pains to acquaint all officers in their stations with the nature and uses of intelligence ratings. To this end, conferences with groups of officers, by regiments or other convenient unit, should be arranged by the chief psychological examiner. In these conferences the methods of examining should be explained clearly and simply, and the possible ways of using psychological information described and illus-

trated. The examiner should strive especially to take the military point of view. Unwarranted claims concerning the accuracy of the results should be avoided. In general, straightforward common-sense statements will be found more convincing than technical descriptions, statistical exhibits, or academic arguments.

In order to make such conferences of the greatest value, the views and criticisms of officers should be elicited as fully as possible. In this way misunderstandings will be cleared up and the way paved for effective cooperation.

The criticisms most likely to arise are the following: (1) That the score made is greatly influenced by such accidental factors as fatigue, homesickness, illness, time of day, etc. (2) That the tests do not measure real ability, but instead merely reflect the man's educational and social advantages. (3) That the score may be greatly influenced by coaching or by a repetition of the test.

While it has been well enough established that such factors as these are not present in a sufficient degree to invalidate seriously the test results, their presence can not be denied. It can hardly be claimed that the mental or physical condition of the subject and the circumstances under which the test is given have no effect upon the score. Similarly, it would be unreasonable to suppose that the result is wholly uninfluenced by educational advantages. While coaching is not likely to invalidate the results to any great extent in army testing, it is nevertheless a factor which should be carefully guarded against by measures designed to prevent the dissemination of blanks. As regards practice effects, it has been found that the average gain in a repeated Alpha examination is approximately 8 points (raw score). The P. E. of an Alpha raw score is approximately 5 points. While cases will admittedly occur in which men will receive a rating on the psychological examination somewhat higher or lower than they deserve, this would occur on any method of classification that might be used. It may well be emphasized that the psychological examination furnishes for immediate use a rating of the men which in validity compares not unfavorably with ratings furnished by officers after months of acquaintance.

In using the psychological results there is a tendency to overlook the fact that they give evidence concerning but one quality important in a good soldier. The company commander should be cautioned not to neglect the importance of other qualities, such as personal appearance, energy, military experience, leadership, initiative, tact, etc. It is no criticism of the psychological rating that it fails to measure these other qualities of the soldier. All it does is to afford a reasonably reliable measure of one essential quality—i. e., general intelligence. Although there is a fairly high correlation between general intelligence and other desirable traits, like character, leadership, etc., the fact must not be overlooked that there are individuals of high intelligence who are not properly fitted to command. It has been proved quite definitely that the results of the psychological examinations are valuable when properly used. They can not, however, be made to take the place of all other criteria. Each officer should be encouraged to scrutinize the men of his command carefully in order to discover their individual differences in other traits as well as in intelligence.

Individual cases will be found in which the information of the company commander is greatly at variance with the psychological rating. In such cases one would not be warranted in making sweeping claims for the infallibility of the test results. It should be pointed out that the discrepancy may be due to the presence or absence of important traits not measured by the intelligence examination. Such cases, however, afford opportunity for the psychological examiner to make clear the value of a rating which is absolute rather than relative. The company commander will readily appreciate the fact that his own estimate is relative; that he inevitably judges his men with reference to the average in his company. For this reason in the company which in general is inferior a high man will be overestimated. Similarly, in a specially high company a low man will be underestimated. Company commanders will readily appreciate the importance of bringing to light extreme cases of unevenness in different organizations in order that such inequalities may be remedied.

II.—SEGREGATION OF ILLITERATES.

Subjects reporting for group examination belong in one of the following classes:

- (1) Men totally illiterate or unable to understand English;
- (2) Men who read or write English only with difficulty;
- (3) Men who read and write English readily.

Examination Alpha will not measure the intelligence of the first group; it may or may not yield a reliable measure for the second group; it will measure the intelligence of the third group.

Group 1 should be given Beta only; group 3 should be given Alpha (but not Beta unless the score earned in Alpha was below D); group 2 should be given both Alpha and Beta in order that men making below D in Alpha because of language difficulty may have opportunity to improve their scores in examination Beta.

Examiners should eliminate at the outset of examination Alpha all total illiterates and men who can not understand English, by ordering these to stand and to leave the Alpha room. They may then be referred to examination Beta. Officers' statements that men can not read and write may be used to advantage in making this separation.

After these men have been segregated and the remaining group satisfactorily placed, each man is supplied with a pencil. Then E. should say: "We are going to pass around some papers now: don't turn any of the pages until I tell you to." Have assistants distribute Alpha booklets, face up, making sure that only one is handed to each man. As soon as the booklets have been distributed E. should continue, slowly and distinctly, pausing after each instruction to give subjects time to respond: "Now, at the top of the page before you, print your name after the word 'Name.' Print your first name first, then your middle initial, if any, and then your last name. Take time to print very *plainly*."

After name has been written, say: "Put your rank in the Army after the word 'Rank,' such as private, corporal, sergeant, sergeant first class," etc. "Put your age in years after the word 'Age.'" "In the next line write your company, regiment, arm, and division." (E. should mention designation of these.)

"In the next line write the name of the State or country in which you were born." "If you were not born in this country, tell next the number of years you have lived in the United States." "After 'Race' write the word 'White.'" (In examining negro troops substitute the word "Negro." If there are Indians in the group, ask them to write the word "Indian." Similarly for Chinese, Japanese, Philipinos, etc.)

"In the next line after 'Occupation,' write your usual work, trade or business (such as carpenter, grocery clerk, laborer, farmer, stu-

dent)." "Next put down how much you earned a week before you entered the Army; not how much a *day* or a *month*, but how much a *week*."

"After 'Schooling,' draw a line under the highest grade or school you attended. For example, if the highest grade you attended was the fifth grade, draw a line under Grade 5; if you attended the second year in the high school or preparatory school, draw a line under High School, Year 2, etc."

After these directions have been given, the orderlies should systematically examine the paper of each man to discover his ability to carry out the above directions. Those subjects who are unable to read and write sufficiently to fill out these headings should be commanded to stand, and on completion of preliminary survey by examiner and his assistants should be ordered to enter examining room for examination Beta.

The above direction is based upon the assumption that a man who can not understand the directions given by E., read the words "occupation," "weekly wages," "schooling," etc., and write the necessary replies, can not do justice to himself in examination Alpha.

III.—GROUP EXAMINATION ALPHA.

1. PROCEDURE.

Examination Alpha is to be given to all subjects who remain in the room after the elimination of illiterates. In giving the following directions E. should speak rather slowly, distinctly, and with proper emphasis. *He should expect and demand perfect order and prompt response to commands.*

When everything is ready E. proceeds as follows: "Attention! The purpose of this examination is to see how well you can remember, think, and carry out what you are told to do. We are not looking for crazy people. The aim is to help find out what you are best fitted to do in the Army. The grade you make in this examination will be put on your qualification card and will also go to your company commander. Some of the things you are told to do will be very easy. Some you may find hard. You are not expected to make a perfect grade, but do the very best you can.

"Now, in the Army a man often has to listen to commands and then carry them out exactly. I am going to give *you* some commands to see how well you can carry them out. Listen closely. Ask no questions. Do not watch any other man to see what *he* does.

"Look at your papers. Just below where you have been writing, there are several sets of forms—circles, triangles, and so forth. First you will be told to do something with the circles at 1, afterwards with the circles at 2, and so on.

"When I call 'Attention,' stop instantly whatever you are doing and hold your pencil up—so. Don't put your pencil down to the paper until I say 'Go.' (Examiner lowers his pencil.) Listen carefully to what I say. Do just what you are told to do. As soon as you are through, pencils up. Remember, wait for the word 'Go.'"

N. B. Examiner.—Give the following instructions very distinctly and at moderate speed. After giving the command "Attention," always notice carefully and have orderlies notice whether all pencils are up. Never proceed until they are. This is especially important in the beginning. Be careful to use the directions that fit the *form* of Alpha booklet distributed. Be careful not to pause or to drop the voice in the course of a compound direction, e. g., in 2, before the words "and also." Raise your pencil whenever you say "Attention." Lower it promptly whenever you say "Go."

Test 1, Form 5.

1. "Attention! 'Attention' always means 'Pencils up.' Look at the circles at 1. When I say 'go' but not before, make a cross in the

first circle and also a figure 1 in the third circle.—Go!” (Allow not over 5 seconds.)

2. “Attention! Look at 2, where the circles have numbers in them. When I say ‘go’ draw a line from Circle 1 to Circle 4 that will pass *above* Circle 2 and *below* Circle 3.—Go!” (Allow not over 5 seconds.)

3. “Attention! Look at the square and triangle at 3. When I say ‘go’ make a cross in the space which is in the triangle but not in the square, and also make a figure 1 in the space which is in the triangle and in the square.—Go!” (Allow not over 10 seconds.)

4. “Attention! Look at 4. When I say ‘go’ make a figure 1 in the space which is in the circle but not in the triangle or square, and also make a figure 2 in the space which is in the triangle and circle, but not in the square.—Go!” (Allow not over 10 seconds.)

(*N. B. Examiner.*—In reading 5, don’t pause at the word CIRCLE as if ending a sentence.)

5. “Attention! Look at 5. If a machine gun can shoot more bullets a minute than a rifle, then (when I say ‘go’) put a cross in the second circle; if not, draw a line *under* the word NO.—Go!” (Allow not over 10 seconds.)

6. “Attention! Look at 6. When I say ‘go’ put in the second circle the right answer to the question: ‘How many months has a year?’ In the third circle do nothing, but in the fourth circle put any number that is a wrong answer to the question that you have just answered correctly.—Go!” (Allow not over 10 seconds.)

7. “Attention! Look at 7. When I say ‘go’ *cross out* the letter just before C and also draw a line *under* the second letter before H.—Go!” (Allow not over 10 seconds.)

8. “Attention! Look at 8. Notice the three circles and the three words. When I say ‘go’ make in the *first* circle the *first* letter of the *first* word; in the *second* circle the first letter of the *second* word, and in the *third* circle the *last* letter of the *third* word.—Go!” (Allow not over 10 seconds.)

9. “Attention! Look at 9. When I say ‘go’ *cross out* each number that is more than 20 but less than 30.—Go!” (Allow not over 15 seconds.)

10. “Attention! Look at 10. Notice that the drawing is divided into five parts. When I say ‘go’ put a 3 or a 2 in each of the two largest parts and any number between 4 and 7 in the part next in size to the smallest part.—Go!” (Allow not over 15 seconds.)

11. “Attention! Look at 11. When I say ‘go’ draw a line through every even number that is not in a square, and also through every odd number that is in a square with a letter.—Go!” (Allow not over 25 seconds.)

12. “Attention! Look at 12. If 7 is more than 5, then (when I say ‘go’) cross out the number 6 unless 6 is more than 8, in which case draw a line *under* the number 7.—Go!” (Allow not over 10 seconds.)

“During the rest of this examination don’t turn any page forward or backward unless you are told to. Now turn over the page to Test 2.”

Test 1, Form 6.

1. "Attention! 'Attention' always means 'Pencils up.' Look at the circles at 1. When I say 'go' but not before, make a cross in the second circle and also a figure 1 in the third circle.—Go!" (Allow not over 5 seconds.)

2. "Attention! Look at 2, where the circles have numbers in them. When I say 'go' draw a line from Circle 2 to Circle 5 that will pass *above* Circle 3 and *below* Circle 4.—Go!" (Allow not over 5 seconds.)

3. "Attention! Look at the square and triangle at 3. When I say 'go' make a cross in the space which is in the square but not in the triangle, and also make a figure 1 in the space which is in the triangle and in the square.—Go!" (Allow not over 10 seconds.)

4. "Attention! Look at 4. When I say 'go' make a figure 1 in the space which is in the triangle but not in the circle or square, and also make a figure 2 in the space which is in the square and circle, but not in the triangle.—Go!" (Allow not over 10 seconds.)

(N. B. Examiner.—In reading 5, don't pause at the word CIRCLE as if ending a sentence.)

5. "Attention! Look at 5. If a regiment is bigger than a company, then (when I say 'go') put a cross in the first circle; if not, draw a line *under* the word NO.—Go!" (Allow not over 10 seconds.)

6. "Attention! Look at 6. When I say 'go' put in the second circle the right answer to the question: 'How many months has a year?' In the fourth circle do nothing, but in the fifth circle put any number that is a wrong answer to the question that you just answered correctly.—Go." (Allow not over 10 seconds.)

7. "Attention! Look at 7. When I say 'go' *cross out* the letter just before D and also draw a line *under* the second letter before I.—Go!" (Allow not over 10 seconds.)

8. "Attention! Look at 8. Notice the three circles and the three words. When I say 'go' make in the *first* circle the *last* letter of the *first* word; in the *second* circle the *last* letter of the *second* word and in the *third* circle the *third* letter of the *third* word.—Go!" (Allow not over 10 seconds.)

9. "Attention! Look at 9. When I say 'go' *cross out* each number that is more than 30 but less than 40.—Go!" (Allow not over 15 seconds.)

10. "Attention! Look at 10. Notice that the drawing is divided into five parts. When I say 'go' put a 3 or a 2 in each of the two smallest parts and any number between 4 and 7 in the part next in size to the largest part.—Go!" (Allow not over 15 seconds.)

11. "Attention! Look at 11. When I say 'go' draw a line through every odd number that is not in a circle and also through every odd number that is in a circle with a letter.—Go!" (Allow not over 25 seconds.)

12. "Attention! Look at 12. If 6 is more than 4, then (when I say 'go') cross out the number 5 unless 5 is more than 7, in which case draw a line *under* the number 6.—Go!" (Allow not over 10 seconds.)

"During the rest of this examination don't turn any page forward or backward unless you are told to. Now turn over the page to Test 2."

Test 1, Form 7.

1. "Attention! 'Attention' always means 'Pencils up.' Look at the circles at 1. When I say 'go' but not before, make a figure 1 in the first circle and also a cross in the third circle.—Go!" (Allow not over 5 seconds.)

2. "Attention! Look at 2, where the circles have numbers in them. When I say 'go' draw a line from Circle 3 to Circle 6 that will pass *above* Circle 4 and below Circle 5.—Go!" (Allow not over 5 seconds.)

3. "Attention! Look at the square and triangle at 3. When I say 'go' make a figure 1 in the space which is in the triangle but not in the square, and also make a cross in the space which is in the triangle and in the square.—Go!" (Allow not over 10 seconds.)

4. "Attention! Look at 4. When I say 'go' make a figure 1 in the space which is in the square but not in the circle or triangle, and also make a figure 2 in the space which is in the circle and triangle, but not in the square.—Go!" (Allow not over 10 seconds.)

(N. B. Examiner.—In reading 5, don't pause at the word CIRCLE as if ending a sentence.)

5. "Attention! Look at 5. If a battleship is larger than a submarine, then (when I say 'go') put a cross in the third circle; if not, draw a line *under* the word NO.—Go!" (Allow not over 10 seconds.)

6. "Attention! Look at 6. When I say 'go' put in the first circle the right answer to the question: "How many months has a year?" In the third circle do nothing, but in the fourth circle put any number that is a wrong answer to the question that you just answered correctly.—Go!" (Allow not over 10 seconds.)

7. "Attention! Look at 7. When I say 'go' *cross out* the letter just before E and also draw a line *under* the second letter before H.—Go!" (Allow not over 10 seconds.)

8. "Attention! Look at 8. Notice the three circles and the three words. When I say 'go' make in the *first* circle the *first* letter of the *first* word; in the *second* circle the *second* letter of the *second* word, and in the *third* circle the *last* letter of the *last* word.—Go!" (Allow not over 10 seconds.)

9. "Attention! Look at 9. When I say 'go' *cross out* each number that is more than 40 but less than 50.—Go!" (Allow not over 15 seconds.)

10. "Attention! Look at 10. Notice that the drawing is divided into five parts. When I say 'go' put a 4 or a 5 in each of the two smallest parts and any number between 6 and 9 in the part next in size to the largest part.—Go!" (Allow not over 15 seconds.)

11. "Attention! Look at 11. When I say 'go' draw a line through every even number that is not in a circle and also through every odd number that is in a circle with a letter.—Go!" (Allow not over 25 seconds.)

12. "Attention! Look at 12. If 5 is more than 3, then (when I say 'go') cross out the number 4 unless 4 is more than 6, in which case draw a line *under* the number 5.—Go!" (Allow not over 10 seconds.)

"During the rest of this examination don't turn any page backward or forward unless you are told to. Now turn over the page to Test 2."

Test 1, Form 8.

1. "Attention! 'Attention' always means 'Pencils up.' Look at the circles at 1. When I say 'go' but not before, make a figure 2 in the second circle and also a cross in the third circle.—Go!" (Allow not over 5 seconds.)

2. "Attention! Look at 2, where the circles have numbers in them. When I say 'go' draw a line from Circle 1 to Circle 4 that will pass *below* Circle 2 and *above* Circle 3.—Go!" (Allow not over 5 seconds.)

3. "Attention! Look at the square and triangle at 3. When I say 'go' make a figure 1 in the space which is in the square but not in the triangle, and also make a cross in the space which is in the triangle and in the square.—Go!" (Allow not over 10 seconds.)

4. "Attention! Look at 4. When I say 'go' make a figure 2 in the space which is in the circle but not in the triangle or square, and also make a figure 3 in the space which is in the triangle and circle, but not in the square.—Go!" (Allow not over 10 seconds.)

(N. B. Examiner.—In reading 5, don't pause at the word CIRCLE as if ending a sentence.)

5. "Attention! Look at 5. If taps sound in the evening, then (when I say 'go') put a cross in the first circle; if not, draw a line *under* the word NO.—Go!" (Allow not over 10 seconds.)

6. "Attention! Look at 6. When I say 'go' put in the first circle the right answer to the question: 'How many months has a year?' In the second circle do nothing, but in the fifth circle put any number that is a wrong answer to the question that you just answered correctly.—Go!" (Allow not over 10 seconds.)

7. "Attention! Look at 7. When I say 'go' *cross out* the letter just after F and also draw a line *under* the second letter after I.—Go!" (Allow not over 10 seconds.)

8. "Attention! Look at 8. Notice the three circles and the three words. When I say 'go' make in the *first* circle the *last* letter of the *first* word; in the *second* circle the *middle* letter of the second word and in the *third* circle the *first* letter of the *third* word.—Go!" (Allow not over 10 seconds.)

9. "Attention! Look at 9. When I say 'go' *cross out* each number that is more than 50 but less than 60.—Go!" (Allow not over 15 seconds.)

10. "Attention! Look at 10. Notice that the drawing is divided into five parts. When I say 'go' put a 4 or a 5 in each of the two largest parts and any number between 6 and 9 in the part next in size to the smallest part.—Go!" (Allow not over 15 seconds.)

11. "Attention! Look at 11. When I say 'go' draw a line through every odd number that is not in a square, and also through every odd number that is in a square with a letter.—Go!" (Allow not over 25 seconds.)

12. "Attention! Look at 12. If 4 is more than 2, then (when I say 'go') cross out the number 3 unless 3 is more than 5, in which case draw a line *under* the number 4.—Go!" (Allow not over 10 seconds.)

"During the rest of this examination don't turn any page forward or backward unless you are told to. Now turn over the page to Test 2."

Test 1, Form 9.

1. "Attention! 'Attention' always means 'Pencils up.' Look at the circles at 1. When I say 'go,' but not before, make a cross in the first circle and also a figure 1 in the last circle.—Go!" (Allow not over 5 seconds.)

2. "Attention! Look at 2, where the circles have numbers in them. When I say 'go' draw a line from Circle 2 to Circle 5 that will pass *below* Circle 3 and *above* Circle 4.—Go!" (Allow not over 5 seconds.)

3. "Attention! Look at the square and triangle at 3. When I say 'go' make a figure 2 in the space which is in the triangle but not in the square, and also make a figure 3 in the space which is in the square and in the triangle.—Go!" (Allow not over 10 seconds.)

4. "Attention! Look at 4. When I say 'go' make a figure 2 in the space which is in the triangle but not in the circle or square, and also make a figure 3 in the space which is in the square and circle, but not in the triangle.—Go!" (Allow not over 10 seconds.)

(*N. B. Examiner.*—In reading 5, don't pause at the word CIRCLE as if ending a sentence.)

5. "Attention! Look at 5. If a captain is superior to a corporal, then (when I say 'go') put a cross in the second circle; if not, draw a line *under* the word NO.—Go!" (Allow not over 10 seconds.)

6. "Attention! Look at 6. When I say 'go' put in the third circle the right answer to the question: 'How many months has a year?' In the fourth circle do nothing, but in the fifth circle put any number that is a wrong answer to the question that you just answered correctly.—Go!" (Allow not over 10 seconds.)

7. "Attention! Look at 7. When I say 'go' *cross out* the letter just after G and also draw a line *under* the second letter after H.—Go!" (Allow not over 10 seconds.)

8. "Attention! Look at 8. Notice the three circles and the three words. When I say 'go' make in the *first* circle the *third* letter of the *first* word; in the *second* circle the *first* letter of the *second* word and in the *third* circle the *first* letter of the *third* word.—Go!" (Allow not over 10 seconds.)

9. "Attention! Look at 9. When I say 'go' *cross out* each number that is more than 60 but less than 70.—Go!" (Allow not over 15 seconds.)

10. "Attention! Look at 10. Notice that the drawing is divided into five parts. When I say 'go' put a 2 or a 3 in each of the two largest parts and any number between 6 and 9 in the part next in size to the smallest part.—Go!" (Allow not over 15 seconds.)

11. "Attention! Look at 11. When I say 'go' draw a line through every even number that is not in a square, and also through every odd number that is in a square with a letter.—Go!" (Allow not over 25 seconds.)

12. "Attention! Look at 12. If 3 is more than 1, then (when I say 'go') cross out the number 2 unless 2 is more than 4, in which case draw a line *under* the number 3.—Go!" (Allow not over 10 seconds.)

"During the rest of this examination don't turn any page forward or backward unless you are told to. Now turn over the page to Test 2."

Test 2.—Arithmetical Problems.

"Attention! Look at the directions at the top of the page while I read them. 'Get the answers to these examples as quickly as you can. Use the side of this page to figure on if you need to.' I will say stop at the end of five minutes. You may not be able to finish all of them, but do as many as you can in the time allowed. The two samples are already answered correctly.—Ready—Go!"

After 5 minutes, say "STOP! Turn over the page to Test 3."

Test 3.—Practical Judgment.

"Attention! Look at the directions at the top of the page while I read them.

"This is a test of common sense. Below are sixteen questions. Three answers are given to each question. You are to look at the answers carefully; then make a cross in the square before the *best* answer to each question, as in the sample:

"Why do we use stoves? Because

☐ they look well

☒ they keep us warm

☐ they are black

"Here the second answer is the best one and is marked with a cross.

"Begin with No. 1 and keep on until time is called.—Ready—Go!" After 1½ minutes, say "STOP! Turn over the page to Test 4."

Test 4.—Synonym—Antonym.

"Attention! Look at the directions at the top of the page while I read them." (E. reads slowly.)

"If the two words of a pair mean the same or nearly the same draw a line under *same*. If they mean the opposite or nearly the opposite, draw a line under *opposite*. If you can not be sure, guess. The two samples are already marked as they should be.—Ready—Go!"

After 1½ minutes, say "STOP! Turn over the page to Test 5." (Pause.) "Now you have to turn your books around this way." (Examiner illustrates the necessary rotation.)

Test 5.—Disarranged Sentences.

"Attention! Look at the directions at the top of the page while I read them." (E. reads slowly.)

"The words *a eats cow grass* in that order are mixed up and don't make a sentence; but they would make a sentence if put in the right order: *a cow eats grass*, and this statement is true.

"Again, the words *horses feathers have all* would make a sentence if put in the order *all horses have feathers*, but this statement is false.

"Below are 24 mixed-up sentences. Some of them are true and some are false. When I say 'go,' take these sentences one at a time.

Think what each *would* say if the words were straightened out, but don't write them yourself. Then, if what it *would* say is true draw a line under the word 'true;' if what it would say is false, draw a line under the word 'false.' If you can not be sure, guess. The two samples are already marked as they should be. Begin with No. 1 and work right down the page until time is called.—Ready—Go!"

After 2 minutes, say "STOP! Turn over the page to Test 6."

Test 6.—Number Series Completion.

(N. B. Examiner.—Give these instructions very slowly.)

"Attention! Look at the first sample row of figures at the top of the page—2, 4, 6, 8, 10, 12; the two numbers that should come next are, of course, 14, 16.

"Look at the second sample—9, 8, 7, 6, 5, 4; the two numbers that should come next are 3, 2.

"Look at the third sample—2, 2, 3, 3, 4, 4; the two numbers that should come next are 5, 5.

"Now look at the fourth sample—1, 7, 2, 7, 3, 7; the next two numbers would, of course, be 4, 7.

"Look at each row of numbers below, and on the two dotted lines write the two numbers that should come next.—Ready—Go!"

After 3 minutes, say "STOP! Turn over the page to Test 7."

Test 7.—Analogies.

"Attention! Look at the first sample at the top of the page: Sky—blue :: grass—table, *green*, warm, big.

"Notice the four words in heavy type. One of them—*green*—is underlined. Grass is *green* just as the sky is blue.

"Look at the second sample: Fish—swims :: man—paper, time, *walks*, girl.

"Here the word *walks* is underlined. A man walks and a fish swims.

"Look at the third sample: Day—night :: white—red, *black*, clear, pure.

"Here the word *black* is underlined because black is the opposite of white just as night is the opposite of day.

"In each of the lines below the first two words are related to each other in some way. What you are to do in each line is to see what the relation is between the first two words, and underline the word in heavy type that is related in the same way to the third word. Begin with No. 1 and mark as many sets as you can before time is called.—Ready—Go!"

After 3 minutes, say "STOP! Turn over the page to Test 8."

Test 8.—Information.

"Attention! Look at the directions at the top of the page while I read them." (E. reads slowly.)

"Notice the sample sentence: People hear with the—eyes—ears—nose—mouth. The correct word is *ears*, because it makes the truest sentence. In each of the sentences below you have four choices for

the last word. Only one of them is correct. In each sentence draw a line under the one of these four words which makes the truest sentence. If you can not be sure, guess. The two samples are already marked as they should be.—Ready—Go! ”

After **4 minutes**, say “STOP! Turn over the page to Test 1 again. In the upper right hand corner, where it says ‘Group No. —,’ put the number 101 ” (or 102, 103, etc., according to the number of this group in the examiner’s series of groups).

Have all examination booklets and pencils collected immediately and before the men are allowed to leave their seats. Before dismissing the group, the number of booklets collected should be carefully checked with the number of men present and the number of booklets issued.

2. DIRECTIONS FOR SCORING.

General Rules.

1. Each item is scored either right or wrong. No part credits are given.
2. In general, items evidently corrected stand as corrected.
3. In tests where the score is "Number Right," only wrong items need be checked in scoring. In Tests 4 and 5, where the score is "Right minus Wrong," wrong and omitted items must be separately checked.
4. Indicate the last item attempted by drawing a long line under that item and out into the margin.
5. Enter the score for each test in lower right-hand corner of the test page and encircle it. When the test has been re-scored, a check mark may be made beside the circle.
6. Red or blue pencil increases accuracy of scoring.

Test 1.

(Score is number right.)

1. No credit is given for any item in which *more* is done than the instructions require.
2. In an item where something is to be written "*in*" a given space, give credit if a mark crosses a line from haste or awkwardness; give no credit if the position is really ambiguous.
3. Where something is to be underlined or crossed out, give credit if two or three underlinings are made in the required place, and give credit for any method of crossing out.
4. *Item 2.*—The pencil line must begin and end either on the circumference or within the circles indicated. It may touch the intermediate circles, but must not cut through them.
5. *Item 6.*—In the circle marked "not 12" there must be some number which is not 12, such as 5, 0, 27.
6. *Item 9.*—The proper numbers must be crossed out to receive credit.
7. *Item 10.*—In Form 5, "2" alone and "3" alone, but not "2 or 3," in each of the two largest parts; "5" alone and "6" alone, but not "5 or 6," in the next to the smallest part, are correct. Similarly for other forms.
8. *Item 11.*—The lines must cross, or at least touch, the proper numbers; they may or may not cut the accompanying letters. Mere indication of the square, triangle, etc., is not sufficient.
9. *Item 12.*—Underlining in place of crossing out is wrong.

Test 2.

(Score is number right.)

1. Answer may be written on dotted line or elsewhere near its problem.
2. If two answers are given to any problem, count as wrong.
3. If it seems clear that, by a slip, one answer has been put in the wrong brackets, and the next answers are all thus misplaced, give credit for the answers that are right even if misplaced.
4. Omission of dollar sign is permissible.
5. Omission of decimal point is permissible in items 2, 9, 13, and 14.
14. Fraction may be expressed as decimal in item 15.

Test 3.

(Score is number right.)

1. Any clear method of indicating answer is given full credit—underlining, checking, etc.
2. If two answers are marked, count as wrong unless one is clearly indicated as final.

Test 4.

(Score is number right minus number wrong.)

1. Any clear method of indicating answer is given credit.
2. When both "Same" and "Opposite" are underlined, counts as *omitted*, not as wrong.
3. If only "Same" is underlined right down the column, score for the test is zero. Similarly if "Opposite" is underlined right down the column.

Test 5.

(Score is number right minus number wrong.)

Same rules as for Test 4.

Test 6.

(Score is number right.)

1. If only one number is written, give no credit.
2. If only one of the numbers is right, give no credit.
3. If four numbers are written, as frequently happens with certain items (i. e., 33, 11 instead of 3, 3), give full credit.

Test 7.

(Score is number right.)

1. Any clear indication other than underlining receives full credit.
2. Underlining of any of the first three words of an item does not remove credit.
3. If two or more of the last four words are marked, give no credit.

Test 8.

(Score is number right.)

Same rules as for Test 7.

3. TOTAL SCORE AND RATING.

The result of examination Alpha is expressed in a total score which is the sum of the raw scores of the several tests. The raw scores are obtained as follows:

Test.	Method of scoring.	Maximum raw score.
1.....	R	12
2.....	R	20
3.....	R	16
4.....	R-W	40
5.....	R-W	24
6.....	R	20
7.....	R	40
8.....	R	40
Total.....		212

Letter ratings are assigned on examination Alpha as follows:

Rating.	Score.
A.....	135-212
B.....	105-134
C+.....	75-104
C.....	45- 74
C-.....	25- 44
D.....	15- 24
D- ¹	0- 14

¹ Recalled for further examination.

All ratings above D— are entered and reported at once. Men whose scores are below D are recalled for examination Beta. Ratings of D— may not be given in Alpha, unless recall of the men for Beta is impossible.

IV.—GROUP EXAMINATION BETA.

1. DIRECTIONS FOR SETTING UP APPARATUS.

Beta materials are shipped in three packages.

1. Blackboard frame.
2. Blackboard chart.
3. (a) Cardboard pieces for Test 7; (b) patterns for constructing cubes for Test 2.

The *blackboard frame* consists of 8 fitted sections, 2 uprights which carry 2 rollers and 4 crossbars which are attached to the small cross-pieces of the uprights. The blackboard should be set up so that the ends of the rollers to which the crank may be fitted come on the right-hand-side. A piece of beaver board 30 by 40 inches should be nailed to the crossbars so as to give a rigid writing surface. This must be procured in the camps.

The *blackboard chart* is a continuous roll 27 feet long. Care should be used in attaching chart to rollers so that it will wind evenly. The chart must be kept as clean as possible at all times. The painting should be gone over from time to time with a white gloss paint.

The *patterns for constructing cubes for test 2* should be drawn on heavy cardboard on a scale such that the constructed model will appear to be made from 3-inch cubes. All cube edges, either real or imaginary, should be bordered in lines $\frac{1}{8}$ -inch thick painted with india ink. The models should be cut on the full lines and folded on the dotted lines as indicated in the patterns furnished. For these cube models a sloping shelf should be so arranged that the perspective from the center of the room will be the same as that of the models represented on the blackboard.

Chalk, eraser, pointer, and a curtain for covering Beta apparatus are also necessary.

2. PROCEDURE.

It is most important that examination Beta be given in a genial manner. The subjects who take this examination sometimes sulk and refuse to work. E. and his assistants will find it necessary to fill out most of the headings for the men before the examination begins. The time required for this preparatory work may be used to advantage in making the men feel at ease. As the demonstration

preparatory to each test requires some time, the "pencils up" command is omitted in examination Beta. The examiner's platform should be so high that he can readily see whether or not the subjects are working. Great care should be taken to prevent the over-anxious from beginning work before the command "Go."

Seating conditions should be such that subjects can not copy from one another and the rule that copying shall not be allowed should be enforced strictly. The blackboard should at all times be kept clean so that the visual conditions may be excellent and constant. The blackboard figures for Test 1 should be exposed when the subjects enter the examining room. **As soon as a test has been demonstrated and the men have been told to go ahead, the blackboard should be covered and kept covered until time is called.** It should not be turned to the next test until the men have been ordered to stop work on a given test. Care should be taken to have the physical conditions of examination reasonably uniform.

With the exception of the brief introductory statements and a few orders, instructions are to be given throughout by means of gestures instead of words. These gestures accompany the samples and demonstrations and should be animated and emphatic.

It is absolutely necessary that directions be followed closely and procedure kept uniform and definite. Variations of procedure are more likely to occur in Beta than in Alpha, and there is serious risk that if allowed they will lessen the value of results. E. should especially guard against using more or fewer gestures or words for one group than for another. Oral language should be rigidly limited to the words and phrases given in the procedure for the different tests.

Whether the men get the idea of the test and enter into it with the proper spirit will depend chiefly on the skill with which the examiner, the demonstrator, and the orderlies carry out their respective parts. Examiner and demonstrator especially should be selected with the greatest care. An examiner who succeeds admirably in giving Alpha may prove to be entirely unadapted for Beta. Both examiner and demonstrator must be adept in the use of gesture language. In the selection of a demonstrator the Personnel Office should be consulted. One camp has had great success with a "window seller" as demonstrator. Actors should also be considered for the work. The orderlies should be able to keep the subjects at work without antagonizing them and to keep them encouraged without actually helping them.

The demonstrator should have the single task of doing before the group just what the group is later to do with the examination blanks. The blackboard is his Beta blank. Before examination Beta can be given satisfactorily the demonstrator must be letter perfect in his part. Both E. and demonstrator must be very careful to stand at the side of the blackboard in order not to hide the drawings.

As soon as the men of a group have been properly seated, pencils should be distributed and also examination blanks with Test 8 up. While this is being done E. should say "Here are some papers. You must not open them or turn them over until you are told to." Holding up Beta blank, E. continues:

"In the place where it says name, write your name; print it if you can. (Pause.) Fill out the rest of the blank about your age, schooling, etc., as well as you can. If you have any trouble we will help you." (The instructions given under segregation may be used for filling out the Beta blank.) E. should announce the group number and see that it as well as the other necessary information is supplied. Before the examination proceeds each paper should be inspected in order to make sure that it is satisfactorily completed.

After the initial information has been obtained, E. makes the following introductory remarks:

"*Attention!* Watch *this* man (pointing to demonstrator). *He* (pointing to demonstrator again) is going to do *here* (tapping blackboard with pointer), what *you* (pointing to different members of group) are to do on your *papers* (here E. points to several papers that lie before men in the group, picks up one, holds it next to the blackboard, returns the paper, points to demonstrator and the blackboard in succession, then to the men and their papers). Ask *no questions*. Wait till I say 'Go ahead!'"

In general, when instructing the group to turn from test to test, E. holds up a Beta blank before group and follows his own instructions as he gives them. As soon as he has turned to desired test or page he says, "This is test X *here*; look!" (pointing to the page).

To suggest to the group the necessity of working rapidly the demonstrator, after proceeding very deliberately with the early samples of each test, hurries, as soon as he has worked out the last sample problem

- (1) to record his response as fast as he can;
- (2) then to catch E.'s eyes for approval and
- (3) finally, to slip away from blackboard, drawing curtain as he does so.

After the personal data called for on page 1 of blank have been gathered and recorded, the orderlies' vocabulary in Beta is rigidly restricted to the following words, or their literal equivalents in Italian, Russian, etc.: *Yes, No, Sure, Good, Quick, How many? Same, Fix it*. Under no circumstances may substitutional explanations or directions be given.

Test 1.—Maze.

"Now turn your papers over. This is Test 1 *here* (pointing to page of record blank). Look." After all have found the page, E. continues, "Don't make any marks till I say 'Go ahead.' Now *watch*." After touching both arrows, E. traces through first maze with pointer and then motions the demonstrator to go ahead. Demonstrator traces path through first maze *with crayon*, slowly and hesitatingly. E. then traces second maze and motions to demonstrator to go ahead. Demonstrator makes one mistake by going into the blind alley at upper left-hand corner of maze. E. apparently does not notice what demonstrator is doing until he crosses line at end of alley; then E. shakes his head vigorously, says "No—no," takes demonstrator's hand and traces back to the place where he may start right again. Demonstrator traces rest of maze so as to indicate an attempt at

haste, hesitating only at ambiguous points. E. says "Good." Then, holding up blank, "Look here," and draws an imaginary line across the page from left to right for every maze on the page. Then, "All right. Go ahead. Do it (pointing to men and then to books). Hurry up." The idea of working fast must be impressed on the men during the maze test. E. and orderlies walk around the room, motioning to men who are not working, and saying, "Do it, do it, hurry up, quick." **At the end of 2 minutes** E. says, "Stop! Turn over the page to Test 2."

Test 2.—Cube Analysis.

"This is Test 2 *here*. Look." After everyone has found the page—"Now watch." The order of procedure is as follows:

(1) E. points to the three-cube model on the blackboard, making a rotary movement of the pointer to embrace the entire picture.

(2) With similar motion he points to the three-cube model on shelf.

(3) E. points next to picture on blackboard and asks, "How much?"

(4) E. turns to cube model and counts aloud, putting up his fingers while so doing, and encouraging the men to count with him.

(5) E. taps each cube on the blackboard and motions to demonstrator, asking him "How much?"

(6) Demonstrator (pointing) counts cubes on blackboard silently and writes the figure 3 in proper place.

In the second sample of this test, when E. counts cubes of model he

(1) counts the three exposed cubes:

(2) touches the unexposed cube with pointer: and

(3) without removing pointer turns model, so that hidden cube comes into view of group. In other respects procedure with second and third samples is the same as with first.

In counting the 12-cube model, E. (1) counts the top row of cubes in the model (left to right), (2) counts the exposed bottom row (right to left), (3) taps with pointer the end cube of hidden row, (4) turns the entire model around and completes his counting. E. then holds model in same plane as drawing and counts (in the same order as above) the cubes on blackboard, counting lines between front and top row as representing the hidden row. He then asks demonstrator "How much?" Demonstrator counts the cubes on blackboard (pointing but not speaking) and writes the response.

Throughout the demonstration the counting is done deliberately, not more rapidly than one cube per second.

At end of demonstration E. points to page and says, "All right. Go ahead." **At the end of 2½ minutes** he says, "Stop! Look at me and don't turn the page."

Test 3.—X-O Series.

"This is Test 3 *here*. Look." After everyone has found the page—"Now watch." E. first points to the blank rectangles at the end, then traces each "O" in chart, then traces outline of "O's" in remaining spaces. Demonstrator, at a gesture, draws them in. E. then traces first "X" in next sample, moves to next "X" by tracing

the arc of an imaginary semicircle joining the two, and in the same manner traces each "X," moving over an arc to the next. He then traces outlines of "X's" in the proper blank spaces, moving over the imaginary arc in each case, and motions to demonstrator to draw them in. Demonstrator, at a gesture, fills in remaining problems very slowly, standing well to the right of the blackboard and writing with his left hand. E. points to page and says, "All right. Go ahead. Hurry up!" **At end of 1½ minutes** he says, "Stop! Turn over the page to Test 4."

Test 4.—Digit—Symbol.

"This is Test 4 *here*. Look." After every one has found the page—"Now watch." E. points to first digit of key on blackboard and then points to the symbol under it. Same for all nine digits in key. E. then (1) points to first digit of sample, (2) to the empty space below digit, (3) points to corresponding digit of key, (4) points to proper symbol under digit in key, and (5) traces the outline of the proper symbol in the blank space under the digit in the sample. Same for first five samples. Demonstrator, at a gesture, fills in all the samples, working as follows: (1) Touches the number in first sample with index finger of right hand; (2) holding finger there, finds with index finger of left hand the corresponding number in key; (3) drops index finger of left hand to symbol for number found; (4) holding left hand in this position writes appropriate symbol in the lower half of sample.

Similarly with the other samples. While working, demonstrator should stand as far as possible to the left, doing all the samples from this side.

At the end of demonstration E. says, "Look, here" and points to key on page, repeating the gestures used in pointing on the blackboard at the beginning of the demonstration. Then, "All right. Go ahead. Hurry up!" Orderlies point out key to men who are at a loss to find it. **At the end of 2 minutes**, E. says, "Stop! But don't turn the page."

Test 5.—Number Checking.

"This is Test 5 *here*. Look." After every one has found the page, "Now watch." In this demonstration E. must try to get "Yes" or "No" responses from the group. If the wrong response is volunteered by group, E. points to digits again and gives right response, "Yes" or "No" as the case may be. E. points to first digit of first number in left column, then to first digit first number in right column, then to second digit first number in left column and second digit first number in right column, nods head, says "Yes" and makes an imaginary cross at end of number in right column. Motions to demonstrator, who makes an "X" there. E. does the same for second line of figures, but here he indicates clearly by shaking head and saying "no" that certain digits are not identical. E. repeats for three more sets and after each, looks at group, says "Yes?" in questioning tone and waits for them to say "Yes"

or "No." He repeats correct reply with satisfaction. Demonstrator checks each after group has responded, or at signal from E. if group does not respond. Demonstrator then works out remaining items, pointing from column to column and working deliberately. E. summarizes demonstrator's work by pointing to the whole numbers in each set and saying "Yes" (indicating X) or "No;" if "No," he shows again where the numbers are unlike. E. then points to page and says "All right. Go ahead. Hurry up!" **At the end of 3 minutes** E. says "Stop. Turn over the page to Test 6."

Test 6.—Pictorial Completion.

"This is Test 6 *here*. Look. A lot of pictures." After every one has found the page, "Now watch." E. points to hand and says to demonstrator, "Fix it." Demonstrator does nothing, but looks puzzled. E. points to the picture of the hand, then to the place where finger is missing and says to demonstrator, "Fix it; Fix it." Demonstrator then draws in finger. E. says, "That's right." E. then points to fish and place for eye and says, "Fix it." After demonstrator has drawn missing eye, E. points to each of the four remaining drawings and says, "Fix them all." Demonstrator works samples out slowly and with apparent effort. When the samples are finished E. says, "All right. Go ahead. Hurry up!" During the course of this test the orderlies walk around the room and locate individuals who are doing nothing, point to their pages, and say, "Fix it. Fix them," trying to set everyone working. **At end of 3 minutes** E. says, "Stop! But don't turn over the page."

Test 7.—Geometrical Construction.

"This is Test 7 *here*. Look." After every one has found the page, "Now watch." Examiner points to the first figure on blackboard. He then takes the two pieces of cardboard, fits them on to the similar drawings on blackboard to show that they correspond and puts them together in the square on blackboard to show that they fill it. Then, after running his finger over the line of intersection of the parts, E. removes the pieces and signals demonstrator, who draws solution in the square on blackboard. The same procedure is repeated for the second and third sample. Demonstrator works out fourth sample, after much study, pointing from the square to the forms.

Demonstrator first draws the two small squares in the upper half of the large square, then the two triangles in the remaining rectangle. Each small figure is drawn in by tracing its entire circumference, not merely the necessary dividing lines. While drawing each small figure in the large square, demonstrator points with index finger of left hand to the corresponding small figure at left of square, taking care not to obstruct the view. At end of demonstration E. holds up blank, points to each square on the page and says, "All right. Go ahead. Hurry up!" **At end of 2½ minutes**, "Stop! Turn over the page." Papers are then collected immediately.

3. DIRECTIONS FOR SCORING.

General Rules.

1. In general, items evidently corrected stand as corrected. The only exception to this rule is in the maze test.
2. In tests where the score is number right, only wrong items need be checked in scoring. In Test 5, where the score is right minus wrong, wrong and omitted items must be separately checked.
3. Enter the score for each test in lower right-hand corner of the test page and encircle it. When the test has been rescored a check may be made beside the circle.
4. Red or blue pencil increases accuracy of scoring.

Test 1.

1. One-half point for each correctly completed half of maze. A half maze is correct if drawn line does not cross any line of maze (except through awkwardness) nor an imaginary straight line across the opening of a wrong passage.
2. Allow much leeway in the cutting of corners.
3. Spur running into any blind passage counts wrong for that half-item, even though erased.
4. When two lines are drawn, one straight across the page, the other correct, full credit is given.

Test 2.

Score is number right.

Test 3.

1. Score is number right.
2. Any incomplete item receives no credit.
3. Count any item correct if intended plan is carried out. Disregard additional unnecessary marks, such as circles between the crosses of items 2 and 4 in first part of line, etc.

Test 4.

1. Score is one-third of number of correct symbols.
2. Use leniency in judging form of symbol.
3. Credit symbol for 2 even though reversed.

Test 5.

1. Score is right minus wrong (number of items checked that should be checked minus number of items checked that should not be checked).
2. If other clear indication is used instead of crosses, give credit.
3. If numbers which should not be checked are marked by some other sign than is used to check similar pairs, count as though not marked.
4. If all items are checked, the score for the test is zero.

Test 6.

1. Score is number right.
2. Allow much awkwardness in drawing. Writing in name of missing part or any way of indicating it receives credit, if idea is clear.
3. Additional parts do not make item wrong, if proper missing part is also inserted.
4. Rules for individual items:
 - Item 4.*—Any spoon at any angle *in right hand* receives credit. Left hand, or unattached spoon, no credit.
 - Item 5.*—Chimney must be in right place. No credit for smoke.
 - Item 6.*—Another ear on same side as first receives no credit.
 - Item 8.*—Plain square, cross, etc., in proper location for stamp, receives credit.
 - Item 10.*—Missing part is the rivet. Line of "ear" may be omitted.
 - Item 13.*—Missing part is leg.
 - Item 15.*—Ball should be drawn in hand of man. If represented in hand of woman, or in motion, no credit.
 - Item 16.*—Single line indicating net receives credit.
 - Item 18.*—Any representation intended for horn, pointing in any direction, receives credit.
 - Item 19.*—Hand and powder puff must be put on proper side.
 - Item 20.*—Diamond is the missing part. Failure to complete hilt on sword is not an error.

Test 7.

1. Score is number right.
2. Allow considerable awkwardness in drawing.
3. Extra subdivisions, if not erased, make item wrong.
4. Rules for individual items:
 - Item 1.*—Line of division may be slightly distant from true center, and need not be straight.
 - Item 3.*—Lines of semi-circumference must start from or near corners of square.
 - Item 4.*—Line must not start from corner.

4. TOTAL SCORE AND RATING.

The result of examination Beta is expressed as a "total score," which is the sum of the raw scores of the several tests. The raw scores are obtained as follows:

Test.	Method of scoring.	Maximum score.
1.....	Half point for each half maze.....	5
2.....	Number right.....	16
3.....	Number right.....	12
4.....	One-third of number right.....	30
5.....	Right minus wrong.....	25
6.....	Number right.....	20
7.....	Number right.....	10
Total.....	.....	118

Letter ratings are assigned on examination Beta as follows:

Rating.	Scores.
A.....	100-118
B.....	90- 99
C+.....	80- 89
C.....	65- 79
C-.....	45- 64
D.....	20- 44
D- ¹	0- 19

¹ Recalled for individual examination.

All ratings above D— are entered and reported at once. Men whose scores fall below D are recalled for individual examination.

Ratings of D— may not be given in examination Beta, unless recall of the men for individual examination is impossible.

V.—INDIVIDUAL EXAMINATIONS.

1. GENERAL DIRECTIONS.

Purpose.—The main purpose of the individual examination is to secure a more accurate measurement of the mental ability of those who have made D— in Alpha or Beta, or in both. By the personal contact it allows it should also yield valuable supplementary information of a kind which can not be brought out by a group examination. All the kinds of information secured should be considered in connection with recommendation concerning a man.

The subjects.—Men who are likely to be summoned for individual examination fall into three classes—*literates*, *illiterates*, and *non-English speaking*. Since the procedure of examination varies importantly with the class, the first task of the examiner is to assign the man who has reported for individual examination to his proper category. The following definitions will assist in the process of classifying:

Literates.—Those who have been allowed to take Alpha may ordinarily be considered literate for purpose of individual examination. Subjects who have not taken Alpha may be considered literate if they have completed the third grade (or its equivalent) in an American school. E. should question S. regarding his opportunities for schooling, and if necessary may test his ability to read and write English.

Illiterates are those who do not meet the above requirements, but who understand and speak English fairly well. The subject may be highly literate in some language but illiterate in English. Such are to be classed as illiterate for the present purpose.

Non-English-speaking subjects are those who, whether foreign born or American born, are unable to understand or speak English sufficiently well to take an oral examination given in English. The majority of such subjects are foreigners, but many foreigners belong in either the literate or the illiterate class instead of in the non-English speaking.

Choice of Examination.—*Literates* should be examined by means of the Point Scale or the Stanford-Binet scale according to availability of materials and preference of the examiner. Usually it will not be necessary to give a literate subject further examination, but if the examiner is in doubt as to proper rating and recommendation concerning subject, he should, after completing examination by the one or the other of these scales, supplement his observations by giving such performance tests as seem desirable.

Illiterates should be examined by means of one or more of the following systematic procedures: (a) the Point Scale as adapted for

illiterates; (b) the Stanford-Binet scale as adapted for illiterates; (c) the Performance Scale with oral instructions. In certain instances it may be obviously desirable or necessary to use the Performance Scale in addition to the one or the other adapted scale. As a rule it should be unnecessary to use other than either the Point-Scale or Stanford-Binet (complete or adapted) in the case of a subject who has attended an American school as much as four or five years. Inability to read and write *after that amount of schooling* nearly always indicates grave mental inferiority, and should not be considered an excuse for failure on such tests as writing from dictation, counting backward, making change, etc. Those who are illiterate from complete lack of educational opportunity should be given the performance scale.

Non-English-speaking subjects can be examined safely only by means of the Performance Scale with non-verbal instructions. Those subjects who understand English slightly may profit by the use of such words as "no," "yes," etc. For this reason words may be used by the examiner to supplement his gestures, but they must not be depended upon as a means of conveying the idea of what is to be done in a given test.

The duration and extent of an individual examination should depend upon the nature of the case and should vary with the information necessary for safe report and recommendation. In some instances only a few tests need be given, in others, even a prolonged examination may leave the examiner in doubt concerning suitable recommendation, and may force him to appeal to company commander or others for supplementary information. Unless conditions render haste imperative, the examiner should obtain a definite intelligence rating for each subject in terms of mental age.

Condensed instructions for administering the Point Scale and the Stanford-Binet scale are printed in this guide for the convenience of examiners, but these instructions can be used safely only on the basis of thorough knowledge of the detailed descriptions of these two scales which are available in book form. The Performance Scale is fully described in this guide, since its constituent parts and their standardization are newly chosen and especially adapted for army use.

It is the task of the psychological examiner to obtain reliable intelligence ratings and to make recommendations based thereupon. Where serious mental peculiarities or psychopathic conditions are discovered, full report should be made and the subject promptly referred to the psychiatrist with such information as the psychological examination has supplied.

The Examiner's Recommendations.—As a result of careful psychological examination, the examiner may conclude, (1) that the subject should be assigned or returned to appropriate military organization for regular training; (2) that he should be assigned or transferred to the Development Battalion or to a service organization in which simple forms of manual labor are the chief requirement; (3) that he should be recommended to the psychiatrist for discharge by reason of intellectual deficiency; (4) that he should be referred to the psychiatrist for further examination because of peculiarities of behavior or definite psychopathic tendencies.

It is impossible to state with safety the particular degree of intellectual deficiency which justifies recommendation for discharge. Other factors than intelligence contribute to a man's serviceableness in the Army. These must be taken into account. If the officers who are attempting to train a man are satisfied with his responses, the indications are that he should not be discharged, even if very inferior in intelligence. *In general, subjects whose mental age is below eight should be seriously considered for discharge or Development Battalion. Those whose mental ages range from eight to ten should be considered for use in special service organizations or for assignment to Development Battalion.* All others, except those whose psychotic symptoms would cause their immediate reference to the neuro-psychiatric examiner, should be assigned to regular training organizations.

Grade E shall be given to all men who are recommended by the examiner for discharge, Development Battalion, or service organizations, *and to such men only.* All men whose intelligence is deemed satisfactory for regular military duty shall be given rating of D— or higher.

In this connection too great emphasis can not be laid upon the use of common sense as well as technical skill and information by the psychological examiner. While doing his utmost to obtain reliable measurement of mental traits, he should be quick to observe indications of qualities of physique, temperament, and character which are important in the soldier.

2. POINT SCALE EXAMINATION.

(a) PROCEDURE.¹

Test 1.—Æsthetic Comparison and Judgment.

Expose first only pair (*a*) of Test 1, trial 1;² next pair (*b*); and last pair (*c*), saying each time, "*Which is the prettier of these two faces?*" If prettier is unintelligible, ask "*Which do you like the better?*" Record judgment (+ or —) each time. If there have been any correct judgments, repeat the procedure with trial 2.

Credit 1 point for each pair, if both judgments have been correct. Total possible credits 3.

Test 2.—Perception and Comparison of Pictures (Missing Parts).

Present card (Test 2, *a*) asking simply, "*What is missing in this picture of a woman?*" If S. responds "hands" or "arms," pass on to the next part of the test, but if instead he says "hat," ask "*What else?*" If again he replies incorrectly, consider the attempt a failure and pass on to card *b, c, d*. With the faces (*c*) and (*d*) covered, present face (*b*) asking, "*What is missing in this face?*" If S. replies "an ear," ask "*What else?*" Similarly present (*c*) and (*d*), giving two chances and no more.

Credit 1 point for each correct response. Total possible credits 4.

¹ The following condensed directions for point scale examination should be supplemented by reference to Yerkes, Bridges and Hardwick, "A Point Scale for Measuring Mental Ability," Warwick and York, Baltimore.

² See material for point scale examination.

Test 3.—Comparison of Lines and Weights.

(a) Present the lines on card (Test 3, a) with the longer one above, saying, "*Which is the longer of these two lines?*" If the answer is incorrect, proceed no farther; if correct, remove the card from view, turn it upside down, and present it with the longer line below. (b) Next place before S. the 3 and 12 gram weights, about 5 centimeters apart, saying, "*I wish you to tell me which is the heavier of these two blocks.*" If S. merely chooses a weight by pointing, ask "*How do you know?*" and if he still hesitates to touch them, say, "*You may touch them if you wish to.*" If S. responds correctly by lifting the weights and selecting the heavier one, reverse the blocks in position and give a second trial. (c) Same procedure, with 6 and 15 gram weights.

Credit 1 point for (a) if both judgments have been correct. Similarly for (b) and (c). Total possible credits 3.

Test 4.—Memory Span for Digits.

Digits Used:

	(a)	(b)	(c)	(d)	(e)
First set-----	374	2947	35871	491572	2749385
Second set-----	581	6135	92736	516283	6195847

Say, "*Listen, and repeat exactly what I say.*" Then read distinctly and at the rate of two per second, in a perfectly monotonous tone, the following digits, "3, 7, 4" and pause for response. If S. fails to grasp the idea and makes no response, tell him again to listen carefully and to say just what you say. Then present again the same set of digits. If S. repeats them correctly, pass on to the first set of four digits given under (b). If he fails to repeat correctly the first set of three digits, he is given the second set "5, 8, 1." If S. fails in this trial, the test is discontinued; if he succeeds, proceed to the next larger group of digits. Similarly for (b), (c), (d), and (e). Only in (a) is a second trial allowed with the first set.

Credit (a), (b), (c), (d), and (e) 1 point each for correct reproduction of either set. Total possible credits 5.

Test 5.—Counting Backward.

(a) Say, "*I wish you to count backward from 20 to 1, like this: 25, 24, 23, 22, 21.*" At this point pause and wait for S. to continue counting. (b) If he is unable to make a start, E. should himself continue "20, 19, 18, 17, 16" and pause again for S. to take up the counting. (c) If once more S. fails to make a start, E. should continue "15, 14, 13, 12, 11" and again pause. (d) If S. is still unable to respond, E. should count "10, 9, 8, 7, 6"—and once more pause.

If S. takes up the counting at 20 and counts without mistake to 1 in about 30 seconds, 4 points credit should be given. If he makes a single mistake (reversal or omission) he should be asked to repeat, and if the mistake is corrected, full credit should be given; if it is not corrected he should be credited for counting from the next multiple of five below his mistake. The credit for counting correctly from 15 to 1 is 3 points; from 10 to 1, 2 points; from 5 to 1, 1 point. The time limit for (b), (c), and (d) is also 30 seconds. Total possible credits 4.

Test 6.—Repetition of Sentences.

Say, "*Listen carefully and repeat just what I say.*" Be sure S. is attending, then read (a) slowly and distinctly. If S. makes no response, repeat. Whether or not S. succeeds with (a) on second trial, proceed to (b). Whenever further failure occurs discontinue the test.

Credit 1 point each for (a) and (b), 2 points each for (c) and (d) repeated correctly, or with only an error due to an evident misunderstanding of a word. Total possible credits, 6.

Test 7.—Description of Pictures.

Show card (Test 7, a) saying, "*Please look at this picture and tell me about it.*" Similarly for (b) and (c).

Credit 1 point each for (a), (b), and (c) for enumeration: 2 points each for description, whether or not accompanied by enumeration: 3 points each for interpretation, whether or not accompanied by description. Total possible credits, 9.

Test 8.—Arranging Weights.

Place 3, 6, 9, 12, and 15-gram weights on table before S. and say, "*These little blocks are all the same size, but they weigh different amounts. Some are heavier and some are lighter. I wish you to place the heaviest one here; and next to it, here, the one which is just a little less heavy; and then here, the one which is a little less heavy than that; and then the one which is still a little less heavy; and finally, here, the lightest one of all.*" While speaking, point to the place on the table where each block belongs. It is essential to give this explicit form of directions to very inferior subjects, but usually E. need only say, "*I wish you to arrange these blocks in order of weight, beginning with the heaviest one, here, and placing the lightest one here, at the opposite end of the series.*" If first arrangement is not correct, give second trial, cautioning S. to be careful and not to hurry too much.

Credit 2 points for one entirely correct arrangement: 1 point, if in either the first or the second trial the arrangement is correct except for the interchange of two consecutive blocks. Total possible credits, 2.

Test 9.—Comparison of Objects.

Say, "*You know what an apple is? You know what a banana is? Tell me how they are different from one another.*" Same procedure for wood and glass, and paper and cloth. If only one point of difference is given, say, "*What other differences are there?*"

Credit 1 point for one correct point of difference, 2 points for two or more correct points of difference in each pair. Total possible credits, 6.

Test 10.—Definitions of Concrete Terms.

Say, (a) "*What is a spoon?*" (b) "*What is a chair?*" and similarly for "*horse*" and "*baby*."

Credit 1 point for definition in terms of use, and 2 points for definition in terms superior to use. (See book.) Total possible credits 8.

Test 11.—Resistance to Suggestion.

Show S. successively cards (a), (b), and (c) with longer line always on S.'s right, saying, "*Which is the longer of these two lines?*" Follow immediately with cards (d), (e), and (f), changing form of question to "*And of these?*" Record each judgment.

Credit 1 point each for response of "equal" or "left" to (d), (e), and (f), provided only there has been no incorrect response to (a), (b), or (c). Total possible credits 3.

Test 12.—Copying Square and Diamond.

Place card (Test 12, a) directly in front of S. and say, indicating back of record sheet, "*Please draw with your pencil a figure just like the one before you.*" Same for card (b).

Credit for square, 2 points for any figure which shows approximate equality of both lines and angles (see scoring card type a), and 1 point for figure showing approximate equality of angles but not of lines, or of lines but not of angles (types b and c): for diamond, 2 points for any figure which shows approximate equality of both pairs of opposite angles (see scoring card, type a), and 1 point for figure showing approximate equality of only one pair of opposite angles (type b): no credit for anything indistinguishable from a square or unidentifiable readily as a diamond (type c). Total possible credits 4.

Test 13.—Free Association.

Say, "*I wish you to say all the words that you can think of in three minutes. When I say 'Ready,' you begin, and say as many words as you can before I tell you to stop. Say such words as pin, table, grass, trees, clouds, horse, dog, brook. All ready. Begin.*" If S. stops, as if assuming that enough words had been given, at the end of a half minute say, "*Go on, please.*" Repeat this, if necessary, at the end of each half minute for the whole period.

Credit for words or phrases (except for repetitions) as follows: 1 point for 30-44 words; 2 points for 45-59 words; 3 points for 60-74; 4 points for 75 and upward. Total possible credits 4.

Test 14.—Use of Three Given Words in One Sentence.

On the back of the record sheet write plainly the words, Boston, money, river. Show them to S., read them over twice, and say, "*I wish you to make one sentence in which the three words Boston, money, and river are used.*" Make sure that S. understands the three words, knows what is meant by a sentence, and grasps the fact that one, not two or more sentences, is required. It is especially necessary to emphasize that the three words are to be used along with other words in making one good sentence. The sentence may either be written, or given orally and recorded by E.

Credit 4 points for the three words used in one sentence; 2 points if they are used in two separate sentences or in sentences very loosely connected. Total possible credits 4.

Test 15.—Comprehension of Questions.

Read each question slowly and distinctly, twice if necessary. If S. fails to respond, he should be encouraged.

(a) *If you were going away and missed your train, what would you do?*

(b) *If some one has been unkind to you and says he is sorry, what should you do?*

(c) *Why should you judge a person by what he does rather than by what he says?*

(d) *Why do we more readily forgive an unkind act done in anger than one done without anger?*

Credit 2 points each for satisfactory answer. Half credit may sometimes be given (see book). Total possible credits, 8.

Test 16.—Drawing Designs from Memory.

Say to S., *"I am going to show you two drawings. After you have looked at them, I shall take them away and ask you to draw both of them from memory. You must look at them carefully, because you will see them for only fifteen seconds, and that is a very short time."*

Credit 2 points for each correct reproduction. Irregularity of line is disregarded. Credit 1 point for imperfect reproductions, such as those in which the rectangle is placed in center of prism, or small squares of (b) turned outward instead of inward (see scoring cards). Total possible credits, 4.

Test 17.—Criticisms of Absurd Statements.

Say *"I am going to read some sentences to you. In each one of them there is something foolish or absurd. (Make sure that S. understands what is meant by "foolish" or by "absurd.") Listen carefully and tell me each time what it is that is foolish."* Read each question slowly and distinctly, twice if necessary, and ask, *"Now, what is foolish about that?"*

(a) *We met a finely dressed gentleman. He was walking along the street with his hands in his pockets and swinging his cane.*

(b) *An unlucky bicycle rider fell on his head and was instantly killed; they took him to the hospital and fear that he cannot get well.*

(c) *A little boy said: "I have three brothers, Paul, Ernest, and myself."*

(d) *At the crossroads was a guidepost with the following directions: "Boston, three miles and a half; if you can't read, inquire at the blacksmith shop."*

(e) *It has been found that the last car of a train is damaged most in case of accident. It would therefore be better to leave off the last car.*

Credit 1 point for each satisfactory response; no partial credits allowed. Total possible credits, 5.

Test 18.—Construction of Sentences.

Show S. card (Test 18, a) and say, "*You see these words. Read them to me, please.*" Be sure S. recognizes the words, then continue, "*Now, please arrange them so that they make sense. Make one good sentence out of them, using every word that you read, but no other words.*"

Credit 2 points each for (a), (b), and (c). No partial credits allowed (see book). Total possible credits, 6.

Test 19.—Definitions of Abstract Terms.

Say, "*What does charity mean?*" "*What does obedience mean?*" "*What does justice mean?*" The definition of charity should express two ideas, that of unfortunates and of kindness shown them. If S. replies "love," ask him "*What sort of love?*" or "*To whom is the love shown?*" The definition of obedience should be "to do what you are told," or the equivalent idea. If S. says "to obey," ask him what obey means. The definition of justice should involve the idea of fairness, of treating people according to their merits, of protection accorded to people or their interests, etc. If S. replies "justice of the peace," tell him that is not the kind of justice meant and give another trial.

For acceptable response, as above defined, credit 2 points for each of the three terms; no partial credits allowed. Total possible credits, 6.

Test 20.—Analogies.

"*If I say Man is to boy as woman is to —, what would you say?*" Pause for a second, and if S. does not respond say "*Girl.*" adding, "*for girl has the same relation to woman as boy has to man.*" Then give the two following examples, supplying the missing term if S. can not do so: "*Boat is to water as train is to —*" (track). "*Chew is to teeth as smell is to —*" (nose). "*Now we'll try some others. Think well before you speak. Don't hurry.*" Give (a) to (f) in order.

Credit 1 point for each correct response. Total possible credits, 6.

(b) ADAPTATION FOR USE WITH ILLITERATES.

In the examination of an illiterate subject, tests 14 and 18 should be omitted and the following additions made to the total score:

Total score.	Points added.
18-51-----	0
52-58-----	2
59-62-----	4
63-69-----	6
70-74-----	8
75-77-----	9
78-90-----	10

(c) EXPRESSING AND INTERPRETING RESULTS.

The results of the point-scale examination should be expressed in the following ways: (1) Total score; (2) mental age; (3) letter rating. The accompanying tables will enable the examiner readily to transmute any point-scale score into mental age and letter rating.

Table of equivalent point-scale values.

Score.	Mental age.	Score.	Mental age.
88 to 100.....	{ 18 or above	51.....	9.1
87.....	17.5	50.....	9
86.....	17	49.....	8.9
85.....	16.5	48.....	8.8
84.....	16.1	47.....	8.7
83.....	15.7	46.....	8.6
82.....	15.3	45.....	8.4
81.....	14.9	44.....	8.3
80.....	14.5	43.....	8.2
79.....	14.2	42.....	8.1
78.....	13.9	41.....	8.0
77.....	13.6	40.....	7.8
76.....	13.4	39.....	7.7
75.....	13.2	38.....	7.5
74.....	13	37.....	7.3
73.....	12.8	36.....	7.2
72.....	12.5	35.....	7.0
71.....	12.3	34.....	6.9
70.....	12	33.....	6.7
69.....	11.8	32.....	6.6
68.....	11.7	31.....	6.4
67.....	11.5	30.....	6.3
66.....	11.3	29.....	6.1
65.....	11.2	28.....	6.0
64.....	11.0	27.....	5.8
63.....	10.8	26.....	5.7
62.....	10.7	25.....	5.5
61.....	10.5	24.....	5.3
60.....	10.3	23.....	5.2
59.....	10.2	22.....	5.0
58.....	10	21.....	4.9
57.....	9.9	20.....	4.7
56.....	9.8	19.....	4.6
55.....	9.6	18.....	4.4
54.....	9.5	17.....	4.3
53.....	9.4	16.....	4.1
52.....	9.3	15.....	4.0

Subjects obtaining a score of 60 points or more may ordinarily be recommended for regular military training; subjects obtaining scores from 40 to 59 points should be considered for assignment to service organizations or to Development Battalion; subjects with scores below 40 points should be considered for discharge.

Letter ratings should be assigned as follows:

A.....	(Not given)
B.....	95-100
C+.....	90-94
C.....	80-89
C-.....	70-79
D.....	60-69
D-.....	0-59

(See below.)

Grade E shall be given to all men who are recommended by the examiner for rejection, discharge, Development Battalion, or service organizations, *and to such men only*. All men whose intelligence is deemed satisfactory for regular military duty shall be given rating of D—or higher.

3. STANFORD-BINET EXAMINATION.

(a) PROCEDURE.¹

III.

1. Pointing to Parts of Body.

Say, "*Show me your nose.*" "*Put your finger on your nose.*" If two or three repetitions of instructions bring no response, say, "*Is this* (pointing to chin) *your nose?*" "*No?*" "*Then where is your nose?*" Same for eyes, mouth and hair.

Credit if correct part is indicated (in any way) three times out of four.

2. Naming Familiar Objects.

Show S, one at a time, key (not Yale), penny (not new), closed knife, watch, pencil. Say each time, "*What is this?*" or "*Tell me what this is.*"

Credit if three responses out of five are correct.

3. Pictures—Enumeration.

Say, "*Now I am going to show you a pretty picture.*" Show picture (a) and say, "*Tell me what you see in this picture,*" or "*Look at the picture and tell me everything you can see in it.*" If no response, "*Show me the —.*" "*That is fine: now tell me everything you see in the picture.*" If necessary ask, "*And what else?*" Same for pictures (b) and (c).

Credit if at least three objects in one picture are enumerated spontaneously, or if one picture is described or interpreted.

4. Giving Sex.

"*Are you a man or a woman?*" If S. does not respond, say "*Are you a woman?*" If answer is "*No*" or a shake of the head, say, "*Well what are you? Are you a man or a woman?*"

5. Giving Last Name.

Ask, "*What is your name?*" If answer is only first or last name, e. g., Walter, say "*Yes, but what is your other name? Walter what?*" and if necessary, "*Is your name Walter Smith?*"

6. Repeating Sentences.

"*Can you say, 'nice kitty'?*" "*Now say 'I have a little dog.'*" If no response, E. may repeat first sentence two or three times. Same procedure for (b) and (c), except that these may be given only once.

¹ Detailed direction for administering Stanford-Binet Scale and for scoring are available in Terman's "The Measurement of Intelligence," Houghton Mifflin Co.

Credit if at least one sentence is given without error after a single reading.

Alt. Repeating Three Digits.

Say, "Listen. Say 4, 2. Now say 6, 4, 1." Etc. May repeat (a), not others. Rate a little faster than one digit per second.

Credit if one set out of the three is given correctly after a single reading.

IV.

1. Comparison of Lines.

Show card and say, "*See these lines. Look closely and tell me which one is longer. Put your finger on the longest one.*" If no response, "*Show me which line is the biggest.*" Show twice more (reversing card at second showing) and ask, "*Which one is the longest here?*" If two out of three are correct, repeat the entire test.

Credit if three responses out of three, or five out of six, are correct.

2. Discrimination of Forms.

Place circle at "X" on card and say, "*Show me one like this,*" at same time passing the finger around the circumference of the circle. If no response, "*Do you see all of these things?*" (running finger over the various forms). "*And do you see this one?*" (pointing to circle again). "*Now, find me another one just like this.*" A first error should be corrected thus, "*No, find me one just like this*" (again passing finger around the outline of form at "X"). Make no comment on any other errors, but pass on to the square, then the triangle, and the rest in any order. Commend successes.

Credit for 7 correct choices out of 10. The first error, if corrected, counts as correct.

3. Counting Four Pennies.

Place four pennies in a horizontal row. Say, "*See these pennies. Count them and tell me how many there are. Count them with your finger, this way*" (pointing to the first one on the subject's left)—"*One.*" "*Now, go ahead.*" If S. gives number without pointing, say, "*No, count them with your finger, this way.*" starting him as before. Have S. count aloud.

Credit for correct count tallying with pointing.

4. Copying Square.

Place card (IV 4) before S., and give pencil, saying, "*You see that?*" (pointing to square). "*I want you to make one just like it. Make it right here*" (showing space on record blank). "*Go ahead. I know you can do it nicely.*" Unless drawing is clearly satisfactory, repeat twice more, saying each time "*Make it exactly like this*" and pointing to model.

Credit if one drawing is satisfactory. (See scoring card.)

5. Comprehension.

Be sure to get S.'s attention before asking question. Repeat if necessary. Allow 20 seconds for answer.

(a) "*What must you do when you are sleepy?*"

(b) "*What ought you to do when you are cold?*"

(c) "*What ought you to do when you are hungry?*"

Credit if two responses of the three are correct.

6. Repeating Four Digits.

Say, "*Now, listen. I am going to say over some numbers and after I am through, I want you to say them exactly as I do. Listen closely and get them just right.*" Give (a), then (b), and (c) if necessary. May repeat (a) until attempt is made, but not others. Rate a little faster than one digit per second.

Credit if one set of the three is correctly repeated in order, after a single reading.

7. Alt. Repeating Sentences.

Say, "*Listen, say this, 'Where is kitty?'*" "*Now, say this, —,*" reading the first sentence in a natural voice, distinctly and with expression. May reread the first sentence.

Credit if at least one sentence is repeated correctly after a single reading.

V.

1. Comparison of Weights.

Place the 3 and 15-gram weights before S., 2 or 3 inches apart. Say, "*You see these blocks. They look just alike, but one of them is heavy and one is light. Try them and tell me which one is heavier.*" Repeat instructions if necessary, saying, "*Tell me which one is the heaviest.*" If S. merely points without lifting blocks, or picks up one at random, say, "*No, that is not the way. You must take the blocks in your hands and try them, like this.*" (Illustrate.) Give second trial with position of weights reversed; third trial with weights in same position as first.

Credit if two of three comparisons are correct.

2. Naming Colors.

Show card (V2) and say, pointing to colors in the order, red, yellow, blue, green. "*What is the name of that color?*"

Credit if all colors are correctly named, without marked uncertainty.

3. Æsthetic Comparison.

Show pairs of faces in order from top to bottom of card. Say, "*Which of these two pictures is the prettiest?*"

Credit if all three comparisons are made correctly.

4. Definitions: Use or Better.

Say, "*You have seen a chair. You know what a chair is. Tell me, what is a chair?*" If necessary urge as follows: "*I am sure you*

know what a chair is. You have seen a chair." "Now, tell me, what is a chair?" If S. rambles say, "Yes, but tell me; what is a chair?" Same for horse, fork, doll, pencil, table.

Credit if four words out of the six are defined in terms of use or better.

5. Patience.

Lay cards thus $\Delta \nabla$, and say, "*I want you to take these two pieces (touching the two triangles) and put them together so they will look exactly like this*"; (pointing to rectangle). If S. hesitates, repeat instructions with a little urging. If first attempt is a failure, replace pieces, saying, "*No; put them together so they will look like this*" (pointing to rectangle). Do not suggest further by face or word whether response is correct. If a piece is turned over, turn it back and don't count that trial. Give, if necessary, three trials of one minute each.

Credit if two of the three trials are successful.

6. Three Commissions:

Take S. to center of room. Say, "*Now, I want you to do something for me. Here's a key. I want you to put it on that chair over there; then I want you to shut (or open) that door, and then bring me the box which you see over there*" (pointing in turn to the objects designated). "*Do you understand? Be sure to get it right. First, put the key on the chair, then shut (or open) the door, then bring me the box (again pointing). Go ahead.*" Stress words *first* and *then*. Give no further aid.

Credit if the three commissions are executed in proper order.

Alt. Giving Age.

Say, "*How old are you?*"

VI.

1. Right and Left.

Say, "*Show me your right hand*" (stress *right* and *hand*, etc., rather strongly and equally). Same for left ear, right eye. If there is one error, repeat whole test, using *left hand, right ear, left eye*. Avoid giving aid in any way.

Credit if three of three, or five of six responses are correct.

2. Missing Parts.

Show card (VI2) and say, "*There is something wrong with this face. It is not all there. Part of it is left out. Look carefully and tell me what part of the face is not there.*" Same for (b) and (c). If S. gives irrelevant answer, say, "*No; I am talking about the face. Look again and tell me what is left out of the face.*" If correct response does not follow, point to the place where eye should be and say, "*See, the eye is gone.*" Then proceed to others, asking, "*What is left out of this face?*" For (d) say, "*What is left out of this picture?*" No help except on (a).

Credit if correct response is made for three of four pictures.

3. Counting Thirteen Pennies.

Place thirteen pennies in horizontal row. Say, "*See these pennies. Count them and tell me how many there are. Count them with your finger, this way*" (pointing to the first one on the subject's left—"One—Now, go ahead." If S. gives number without pointing, say, "*No, count them with your finger, this way,*" starting him as before. Have S. count aloud. Second trial given if only minor mistake is made.

Credit if one correct count, tallying with the pointing, is made in first or second trials.

4. Comprehension.

Say (a) "*What's the thing for a boy to do if it is raining when he starts to school?*"

(b) "*What's the thing to do if you find that your house is on fire?*"

(c) "*What's the thing to do if you are going some place and miss your train (car)?* May repeat a question, but do not change form.

Credit if two of three responses are correct. (See book.)

5. Naming Four Coins.

Show in order nickel, penny, quarter, dime, asking, "*What is that?*" If answer is "money," say, "*Yes, but what do you call that piece of money?*"

Credit if three of four responses are correct.

6. Repeating Sentences.

Say, "*Now, listen. I am going to say something and after I am through I want you to say it over just as I do. Understand? Listen carefully and be sure to say exactly what I say.*" Repeat, "*say exactly what I say,*" before reading each sentence. Do not re-read any sentence.

Credit if one sentence out of three is repeated without error, or two with not more than one error each.

Alt. Forenoon and Afternoon.

If a. m., ask, "*Is it morning or afternoon?*" If p. m., "*Is it afternoon or morning?*"

VII.

1. Giving Numbers of Fingers.

Say, "*How many fingers have you on one hand?*" "*How many on the other hand?*" "*How many on both hands together?*" If S. begins to count, say, "*No, don't count. Tell me without counting,*" and repeat question.

Credit if all three questions are answered correctly and promptly without counting (5, 5, 10 or 4, 4, 8).

2. Pictures; Description.

Show card (a) and say, "*What is this picture about?*" "*What is this a picture of?*" May repeat question, but do not change it. Same for (b) and (c).

Credit if two of the three pictures are described or interpreted. (See book.)

3. Repeating Five Digits.

Say, "*Now, listen. I am going to say over some numbers and after I am through, I want you to say them exactly as I do. Listen closely and get them just right.*" Give (a), and if necessary (b) and (c). Do not re-read any set.

Credit if one set of the three is given correctly.

4. Tying Bow Knot.

Show S. the completed bow knot and say: "*You know what kind of a knot this is, don't you? It is a bow knot. I want you to take this other piece of string and tie the same kind of knot around my finger.*" Give S. string of same length and hold finger (or pencil, etc.) conveniently for S.

Credit if double bow (both ends folded in) is tied within one minute. The usual half knot as basis must not be omitted. Single bow, half credit.

5. Giving Differences.

Say, "*What is the difference between a fly and a butterfly?*" If S. does not understand, say, "*You know flies, do you not? You have seen flies? And you know the butterflies? Now, tell me the difference between a fly and a butterfly.*" Same for stone and egg, and wood and glass.

Credit if any real difference is given in two of three questions.

6. Copying Diamond.

Place card VII⁶ before S., and give pen, saying, "*I want you to draw one exactly like this. Make it right here*" (showing space on record blank). Give three trials if necessary, saying each time, "*Make it exactly like this one.*" (Note that pen and ink must be used.)

Credit if two drawings are satisfactory. (See scoring card.)

Alt. 1. Naming Days of Week.

Say, "*You know the days of the week, do you not?*" "*Name the days of the week for me.*" If response is correct, check by asking, "*What day comes before Tuesday?*" "*Before Thursday?*" "*Before Friday?*"

Credit if correct response is given within 15 seconds, and if two of three checks are correct.

Alt. 2. Three Digits Backwards.

Say, "*Listen carefully. I am going to read some numbers again but this time I want you to say them backwards. For example, if I should say 5—1—4, you would say 4—1—5. Do you understand?*" Then, "*Ready, now; listen carefully, and be sure to say the numbers backwards.*" If S. gives digits forwards, repeat instructions. If necessary, give (b) and (c), repeating, "*Ready, now; listen carefully, and be sure to say the numbers backwards.*"

Credit if one set is repeated backwards without error.

VIII.

1. Ball and Field.

Present "round field" on record blank with gate facing S. and say, "*Let us suppose that your baseball has been lost in this round field. You have no idea what part of the field it is in. You don't know what direction it came from, how it got there, nor with what force it came. All you know is that the ball is lost somewhere in the field. Now, take this pencil and mark out a path to show me how you would hunt for the ball so as to be sure not to miss it. Begin at the gate and show me what path you would take.*" If S. stops, say, "*But suppose you have not found it yet, which direction would you go next?*"

Credit in Year VIII for "inferior" plan (or better); in Years VIII and XII for "superior" plan. (See scoring card.)

2. Counting 20 to 1.

Say, "*You can count backwards, can you not? I want you to count backwards for me from 20 to 1. Go ahead.*" If S. counts 1-20 say, "*No, I want you to count backwards from 20 to 1, like this: 20—19—18 and clear on down to 1. Now, go ahead.*" Have S. try, even if he says he can't, but do not prompt.

Credit for counting from 20 to 1 within 40 seconds with not more than one error. Spontaneous corrections allowed.

3. Comprehension.

Say, "*What's the thing for you to do:*

(a) "*When you have broken something which belongs to someone else?*"

(b) "*When you are on your way to work and notice that you are in danger of being late?*"

(c) "*If someone hits you without meaning to do it?*"

Questions may be repeated once or twice, but form must not be changed.

Credit if two of three responses are correct. (See book.)

4. Finding Likenesses: Two Things.

Say, "*I am going to name two things which are alike in some way, and I want you to tell me how they are alike.*"

(a) "*Wood and coal: in what way are they alike?*" If difference is given, say, "*No, I want you to tell me how they are alike. In what way are wood and coal alike?*"

(b) "*In what way are an apple and a peach alike?*"

(c) "*In what way are iron and silver alike?*"

(d) "*In what way are a ship and an automobile alike?*"

Credit if any real likeness is given for two of the four pairs. (See book.)

5. Definitions: Superior to Use.

Ask, "*What is a balloon?*" Same for *tiger, football, soldier*. Do not comment on responses. May repeat questions.

Credit if two of four definitions better than use are given.

6. Vocabulary.

See page 66.

Alt. 1. Naming Six Coins.

Show nickel, penny, quarter, dime, silver dollar and half-dollar in order, asking, "*What is that?*" If answer is "money," say, "*Yes, but what do you call that piece of money?*"

Credit if all six coins are correctly named. Spontaneous corrections allowed.

Alt. 2. Writing from Dictation.

Give pen, ink, and paper, and say, "*I want you to write something for me as nicely as you can. Write these words: 'See the little boy.' Be sure to write it all: 'See the little boy.'*" Do not dictate the words separately, nor give further repetition.

Credit if sentence is written without omission of word, and legibly enough to be easily recognized. Misspelling disregarded if word is easily recognizable. (See scoring card.)

IX.

1. Giving the Date.

Ask in order, (a) "*What day of the week is to-day?*" (b) "*What month is it?*" (c) "*What day of the month is it?*" (d) "*What year is it?*" If S. gives day of month for day of week, or *vice versa*, repeat question with suitable emphasis. No other help.

Credit if there is no error greater than three days in (c) and no error in (a), (b), and (d). Spontaneous correction allowed.

2. Arranging Five Weights.

Place 3, 6, 9, 12, and 15 gram weights before S. and say, "*See these blocks. They all look alike, don't they? But they are not alike. Some of them are heavy, some are not quite so heavy, and some are still lighter. No two weigh the same. Now, I want you to find the heaviest one and place it here. Then find the one that is just a little lighter and put it here. Then put the next lighter one here, and the next lighter one here, and the lightest of all at this end [pointing]. Do you understand? Remember now, that no two weights are the same. Find the heaviest one and put it here, the next heaviest here, and lighter, lighter, until you have the very lightest here. Ready; go ahead.*" Give second and, if necessary, third trial, repeating instructions only if S. has used an absurd procedure.

Credit for correct arrangement in two of three trials.

3. Making Change.

Ask, "*If I were to buy 4 cents worth of candy and should give the storekeeper 10 cents, how much money would I get back?*" Similarly for 15-12 cents; and 25-4 cents. S. is not allowed coins or pencil and paper. If S. forgets problem, repeat once, but not more. Spontaneous corrections allowed.

Credit if two answers of three are correct.

4. Four Digits Backwards.

Say, "*Listen carefully. I am going to read some numbers, and I want you to say them backwards. For example, if I should say 5—1—4, you would say 4—1—5. Do you understand?*" Then, "*Ready now; listen carefully, and be sure to say the numbers backwards.*" If S. gives digits forwards, repeat instructions. If necessary, give (b) and (c), repeating each time, "*Ready now; listen carefully, and be sure to say the numbers backwards.*"

Credit if one set is repeated backwards without error.

5. Three Words in One Sentence.

Say, "*You know what a sentence is, of course. A sentence is made up of some words which say something. Now, I am going to give you three words, and you must make up a sentence that has all three words in it. The three words are 'boy,' 'river,' 'ball.' Go ahead and make up a sentence that has all three words in it.*" Repeat instructions if necessary, but do not illustrate. May say, "*The three words must be put with some other words so that all of them together will make a sentence.*" Give only one trial, and do not caution against making more than one sentence. Do not hurry S., but allow only one minute. Then say, "*Now make a sentence that has in it the three words 'work,' 'money,' 'men.'*" If necessary give (c) *desert, rivers, lakes*, in same way.

Credit if satisfactory sentence is given in two of three trials. (See book.)

6. Finding Rhymes.

Say, "*You know what a rhyme is, of course. A rhyme is a word that sounds like another word. Two words rhyme if they end in the same sound. Understand?*" Continue, "*Take the two words 'hat' and 'cat.' They sound alike and so they make a rhyme. 'Hat,' 'cat,' 'rat,' 'bat,' all rhyme with one another. Now, I am going to give you a word and you will have one minute to find as many words as you can that rhyme with it. The word is 'day.' Name all the words you can think of that rhyme with 'day.'*" If S. fails, repeat explanation, and give sample rhymes for day, as *say, may, pay, hay*. Otherwise, proceed, "*Now, you have another minute to name all the words you can think of that rhyme with 'mill.'*" Same, if necessary, for *spring*. Do not repeat explanation after "mill" or "spring."

Credit if three rhymes in one minute are given for each of two out of three words.

Alt. 1. Naming the Months.

Say, "*Name all the months of the year.*" If correct, check by asking, "*What month comes before April?*" "*Before July?*" "*Before November?*"

Credit if months are correctly named within 15 seconds with not more than one error, and if two of three checks are correct.

Alt. 2. Counting Value of Stamps.

Say, "*You know, of course, how much a stamp like this costs (pointing to a 1-cent stamp). And you know how much one like*

this costs (pointing to a 2-cent stamp). Now, how much money would it take to buy all these stamps?" (showing three 1-cent stamps and three 2-cent stamps). Do not tell values, where not known; if values are known but sum is wrongly given, give second trial, saying, "Tell me how you got it."

Credit if correct value is given in not over 15 seconds.

X.

1. Vocabulary.

See page 66.

2. Absurdities.

"I am going to read a sentence which has something foolish in it, some nonsense. I want you to listen carefully and tell me what is foolish about it." After reading say, "What is foolish about that?" Give sentences twice if necessary, repeating exactly. If response is ambiguous, ask S. what he means.

(a) A man said: "I know a road from my house to the city which is down hill all the way to the city and down hill all the way back home."

(b) An engineer said that the more cars he had on his train the faster he could go.

(c) Yesterday the police found the body of a girl cut into 18 pieces. They believe that she killed herself.

(d) There was a railroad accident yesterday, but it was not very serious. Only 48 people were killed.

(e) A bicycle rider, being thrown from his bicycle in an accident, struck his head against a stone and was instantly killed. They picked him up and carried him to the hospital, and they do not think he will get well again.

Credit if four responses out of five are satisfactory.

3. Drawing Designs from Memory.

Give S. pencil and paper, then say, *"This card has two drawings on it. I am going to show them to you for ten seconds, then I will take the card away and let you draw from memory what you have seen. Examine both drawings carefully and remember that you have only ten seconds."* Show card X³ for 10 seconds, right side up. Have S. reproduce designs immediately, and note on his paper which is the top of his drawing.

Credit if one design is reproduced correctly, with other at least half correct. (See scoring cards.)

4. Reading and Report.

Show card and say, *"I want you to read this for me as nicely as you can."* Pronounce for S. all words he can not make out, allowing not over 5 seconds' hesitation. (Record reading time and errors.) When S. has finished, say, *"Very well done. Now, I want you to tell me what you read. Begin at the first and tell everything you can remember."* When S. stops, ask, *"And what else? Can you remember any more of it?"*

New York, | September 5th. | A fire | last night | burned | three houses | near the center | of the city. | It took some time | to put it out. | The loss | was fifty thousand dollars, | and seventeen families | lost their homes. | In saving | a girl | who was asleep | in bed, | a fireman | was burned | on the hands.

Credit if selection is read within 35 seconds with not more than two errors and if report given contains at least eight "memories" as separated above. Minor changes in wording allowed. Scoring is done by placing thin paper over barred copy above and checking memories.

5. Comprehension.

Ask in order,

(a) "*What ought you to say when someone asks your opinion about a person you don't know very well?*"

(b) "*What ought you to do before undertaking (beginning) something very important?*"

(c) "*Why should we judge a person more by his actions than by his words?*"

May repeat but not change question except to substitute *beginning* in (b) in case *undertaking* seems not to be understood.

Credit if two of three replies are satisfactory. (See book.)

6. Naming Sixty Words.

Say, "*Now, I want to see how many different words you can name in 3 minutes. When I say ready, you must begin and name the words as fast as you can, and I will count them. Do you understand? Be sure to do your very best, and remember that just any words will do, like 'clouds,' 'dog,' 'chair,' 'happy'—ready; go ahead.*" Whenever there is a pause of 15 seconds, say, "*Go ahead, as fast as you can. Any words will do.*" Don't allow sentences or counting; if attempted, interrupt with "*Counting (or sentences) not allowed. You must name separate words. Go ahead.*"

Credit if 60 words, exclusive of repetitions, are given in three minutes.

Alt. 1. Repeating Six Digits.

"*Now, listen. I am going to say over some numbers and after I am through I want you to say them exactly as I do. Listen closely and get them just right.*" Give (a) and if necessary (b).

Credit if one set is given without error.

Alt. 2. Repeating Sentences.

Say, "*Now, listen. I am going to say something and after I am through I want you to say it over just as I do. Understand? Listen carefully and be sure to say exactly what I say.*" Repeat "*Say exactly what I say*" before reading each sentence. Do not re-read any sentence.

Credit if one sentence out of three is repeated without error, or two with not more than one error each.

Alt. 3. Healy-Fernald Puzzle.

Place frame (short side toward S.) and blocks on table and say, "*I want you to put these blocks in this frame so that all the space will be filled up. If you do it rightly, they will all fit in and there will be no space left over. Go ahead.*" Do not suggest hurrying. Note procedure, especially tendencies to repeat absurd moves, and moves which leave spaces obviously impossible to fill.

Credit if S. fits blocks into place three times within a total time of five minutes for the three trials.

XII.**1. Vocabulary.**

See page 66.

2. Definitions: Abstract Words.

Say, "*What is pity?*" "*What do we mean by pity?*" etc. If response contains word to be defined, ask, "*Yes, but what does it mean to pity some one?*" Same for *revenge, charity, envy, justice*. Question S. if response is not clear.

Credit if three of the five words are satisfactorily defined. (See book.)

3. Ball and Field.

Present "round field" on record blank with gate facing S. and say, "*Let us suppose that your baseball has been lost in this round field. You have no idea what part of the field it is in. You don't know what direction it came from, how it got there, nor with what force it came. All you know is that the ball is lost somewhere in the field. Now, take this pencil and mark out a path to show me how you would hunt for the ball so as to be sure not to miss it. Begin at the gate and show me what path you would take.*" If S. stops, say, "*But suppose you have not found it yet, which direction would you go next?*"

Credit in Year VIII for "inferior" plan (or better); in Years VIII and XII for "superior" plan. (See scoring card.)

4. Dissected Sentences.

Show card XII⁴, indicate first group of words, and say, "*Here is a sentence that has the words all mixed up, so that they don't make any sense. If the words were changed around in the right order they would make a good sentence. Look carefully and see if you can tell me how the sentence ought to read.*" Do not hurry S., but allow only one minute. If S. fails on the first sentence, read it for him slowly and correctly, pointing at each word as you speak it. Same procedure for second and third, except that no help is given.

Credit if two sentences of three are correct, or one correct and two nearly correct. (See book.) Time, one minute each.

5. Interpretation of Fables.

Present fables in order given below. Say, "*You know what a fable is? You have heard fables? Fables, you know, are little stories which teach us a lesson. Now, I am going to read a fable to you. Listen carefully, and when I am through I will ask you to tell me*

what lesson the fable teaches us." After reading, say, "*What lesson does that teach us?*" Question S. if response is not clear. Ask also if fable has been heard before. Proceed with (b), (c), (d), and (e) thus: "*Here is another. Listen again and tell me what lesson this fable teaches us.*" After each ask, "*What lesson does that teach us?*"

(a) *Hercules and the wagoner.*

A man was driving along a country road, when the wheels suddenly sank in a deep rut. The man did nothing but look at the wagon and call loudly to Hercules to come and help him. Hercules came up, looked at the man, and said: "Put your shoulder to the wheel, my man, and whip up your oxen." Then he went away and left the driver.

(b) *The milkmaid and her plans.*

A milkmaid was carrying her pail of milk on her head, and was thinking to herself thus: "The money for this milk will buy 4 hens; the hens will lay at least 100 eggs; the eggs will produce at least 75 chicks; and with the money which the chicks will bring I can buy a new dress to wear instead of the ragged one I have on." At this moment she looked down at herself, trying to think how she would look in her new dress; but as she did so the pail of milk slipped from her head and dashed upon the ground. Thus all her imaginary schemes perished in a moment.

(c) *The fox and the crow.*

A crow, having stolen a bit of meat, perched in a tree and held it in her beak. A fox, seeing her, wished to secure the meat, and spoke to the crow thus: "How handsome you are! And I have heard that the beauty of your voice is equal to that of your form and feathers. Will you not sing for me, so that I may judge whether this is true?" The crow was so pleased that she opened her mouth to sing and dropped the meat, which the fox immediately ate.

(d) *The farmer and the stork.*

A farmer set some traps to catch cranes which had been eating his seed. With them he caught a stork. The stork, which had not really been stealing, begged the farmer to spare his life, saying that he was a bird of excellent character, that he was not at all like the cranes, and that the farmer should have pity on him. But the farmer said: "I have caught you with these robbers, the cranes, and you have got to die with them."

(e) *The miller, his son, and the donkey.*

A miller and his son were driving their donkey to a neighboring town to sell him. They had not gone far when a child saw them and cried out: "What fools those fellows are to be trudging along

on foot when one of them might be riding." The old man, hearing this, made his son get on the donkey, while he himself walked. Soon they came upon some men. "Look," said one of them, "see that lazy boy riding while his old father has to walk." On hearing this the miller made his son get off, and he climbed upon the donkey himself. Farther on they met a company of women, who shouted out: "Why, you lazy old fellow, to ride along so comfortably while your poor boy there can hardly keep pace by the side of you!" And so the good-natured miller took his boy up behind him and both of them rode. As they came to the town a citizen said to them, "Why, you cruel fellows! You two are better able to carry the poor little donkey than he is to carry you." "Very well," said the miller, "we will try." So both of them jumped to the ground, got some ropes, tied the donkey's legs to a pole and tried to carry him. But as they crossed the bridge the donkey became frightened, kicked loose, and fell into the stream.

Credit in Year XII if score is 4 points or more; in Year XVI if score is 8 points or more. Allow 2 points for each fable for correct, and 1 for partially correct response. (Note carefully scoring directions in book.)

6. Five Digits Backwards.

"Listen carefully; I am going to read some numbers, and I want you to say them backwards. For example, if I should say 5—1—4, you would say 4—1—5. Do you understand?" Then, "Ready now; listen carefully, and be sure to say the numbers backwards." If S. gives digits forwards, repeat instructions. If necessary, give (b) and (c), repeating each time, "Ready now; listen carefully and be sure to say the numbers backwards."

Credit if one set is repeated backwards without error.

7. Pictures; Interpretation.

Show in succession Dutch Home, River Scene, Post-Office, and Colonial House, saying each time, "Tell me what this picture is about. Explain this picture." May prompt with, "Go ahead," or "Explain what you mean."

Credit if three of the four pictures are satisfactorily interpreted. (See book.)

8. Finding Likenesses; Three Things.

Say, "I am going to name three things which are alike in some way, and I want you to tell me how they are alike. Snake, cow, and sparrow; in what way are they alike?" May repeat or urge with, "I'm sure you can tell me how a snake, a cow, and a sparrow are alike," but do not change form of question. If difference is given, say, "No, I want you to tell me how they are alike. In what way are a snake, a cow, and a sparrow alike?" Same for (b) book, teacher, newspaper; (c) wool, cotton, leather; (d) knife-blade, penny, piece of wire; (e) rose, potato, tree.

Credit if any real similarity is given in three out of five trials.

XIV.

1. Vocabulary.

See page 66.

2. Induction Test.

(If XVIII² is to be given, it should precede this test.) Provide six sheets of tissue paper, 8½ by 11 inches. Take the first sheet, and telling S. to watch what you do, fold it once, and in the middle of the folded edge cut out a small notch; then ask S. to tell you *how many holes there will be in the paper when it is unfolded*. Whatever the answer, unfold the paper and hold it up broadside for S.'s inspection. Next, take another sheet, fold it once as before and say, "*Now, when we folded it this way and tore out a piece, you remember it made one hole in the paper. This time we will give the paper another fold and see how many holes we shall have.*" Then proceed to fold the paper again, this time in the other direction, cut out a piece from the folded side, and ask *how many holes there will be when the paper is unfolded*. Then unfold the paper, hold it up before S. so as to let him see the result. Whatever the answer, proceed with the third sheet. Fold it once and say, "*When we folded it this way there was one hole.*" Fold it again and say, "*And when we folded it this way there were two holes.*" Fold the paper a third time and say, "*Now, I am folding it again. How many holes will it have this time when I unfold it?*" Again unfold paper while S. looks on. Continue in the same manner with sheets, four, five, and six, adding one fold each time. In folding each sheet recapitulate results, saying (with the sixth, for example): "*When we folded it this way there was one hole; when we folded it again there were two; when we folded it again there were four; when we folded it again there were eight; when we folded it again there were sixteen; now tell me how many holes there will be if we fold it once more.*" Avoid saying, "When we folded it once, twice, three times." After sixth response, ask, "*Can you tell me a rule by which I could know each time how many holes there are going to be?*"

Credit if answer to sixth question is correct, and governing rule is correctly stated.

3. President and King.

Say, "*There are three main differences between a president and a king; what are they?*" If S. stops after one difference is given, urge him on, if possible, until three are given.

Credit if two of the three correct answers are given.

4. Problem Questions.

Say, "*Listen, and see if you can understand what I read.*" Then read the problem slowly and with expression. If necessary, re-read problem.

(a) *A man who was walking in the woods near a city stopped suddenly very much frightened, and then ran to the nearest policeman, saying, that he had just seen hanging from the limb of a tree a — a what?*

(b) *My neighbor has been having queer visitors. First, a doctor came to his house, then a lawyer, then a minister (preacher or priest). What do you think happened there?*

(c) *An Indian who had come to town for the first time in his life saw a white man riding along the street. As the white man rode by, the Indian said: "The white man is lazy; he walks sitting down." What was the white man riding on that caused the Indian to say, "He walks sitting down"?*

Credit if two of the three problems are satisfactorily answered.

5. Arithmetical Reasoning.

Give S. card XIV⁵, exposing problems one at a time. Have S. read each problem aloud and, with the printed problem still before him, find the answer without the use of pencil or paper. In the case of illiterates, E. reads each problem for S. two or three times.

Credit if two of the three problems are correctly solved, within one minute each.

6. Reversing Hands of Clock.

Say, "*Suppose it is six-twenty-two o'clock, that is, twenty-two minutes after six; can you see in your mind where the large hand would be, and where the small hand would be?*" "*Now, suppose the two hands of the clock were to trade places, so that the large hand takes the place where the small hand was, and the small hand takes the place where the large hand was, what time would it then be?*" Repeat the test with the hands at 8.08 (8 minutes after 8), and again with the hands at 2.46 (14 minutes before 3).

Credit if two of the three problems are solved with reasonable accuracy. (See book).

Alt. Repeating Seven Digits.

"*Now listen. I am going to say over some numbers and after I am through, I want you to say them exactly as I do. Listen closely and get them just right.*" Give (a) and if necessary (b).

Credit if one set is reproduced without error.

XVI.—"Average Adult."

1. Vocabulary.

See page 66.

2. Interpretation of Fables.

See page 58.

3. Differences Between Abstract Terms.

Ask "*What is the difference between—*

- (a) "*Laziness and idleness?*"
- (b) "*Evolution and revolution?*"
- (c) "*Poverty and misery?*"
- (d) "*Character and reputation?*"

If answer is ambiguous, get S. to explain. If he merely defines the words, say "*Yes, but I want you to tell me the difference between — and —.*"

Credit if three of the four answers are given correctly. (See book.)

4. Enclosed Boxes.

Show S. a small cardboard box, and say, "*You see this box; it has two smaller boxes inside of it, and each one of the smaller boxes contains a little tiny box. How many boxes are there altogether, counting the big one? Remember, first the large box, then two smaller ones, and each of the smaller ones contains a little tiny box.*" Allow one-half minute, record answer, then show second box, saying, "*This box has two smaller boxes inside, and each of the smaller boxes contains two tiny boxes. How many altogether? Remember, first the large box, then two smaller ones, and each smaller one contains two tiny boxes.*" Similarly for (c) and (d), using three and three, and four and four.

Credit if three of the four problems are solved correctly within one-half minute each.

5. Six Digits Backwards.

Say "*Listen carefully. I am going to read some numbers, and I want you to say them backwards. For example, if I should say 5—1—4, you would say 4—1—5. Do you understand?*" Then, "*Ready now; listen carefully, and be sure to say the numbers backwards.*" If S. gives digits forwards repeat instructions. If necessary, give (b) and (c), repeating each time, "*Ready now; listen carefully and be sure to say the numbers backwards.*"

Credit if one set is repeated backwards without error.

6. Code.

Show S. the code given on card XVI^c. Say, "*See these diagrams here? Look and you will see that they contain all the letters of the alphabet. Now, examine the arrangement of the letters. They go (pointing) a b c, d e f, g h i, j k l, m n o, p q r, s t u v, w x y z. You see the letters in the first two diagrams are arranged in the up-and-down order (pointing again), and the letters in the other two diagrams run in just the opposite way from the hands of a clock (pointing). Look again and you will see that the second diagram is just like the first, except that each letter has a dot with it, and that the last diagram is like the third except that here, also, each letter has a dot. Now, all of this represents a code; that is, a secret language. It is a real code, one that was used in the Civil War for sending secret messages. This is the way it works: We draw the lines which hold a letter, but leave out the letter. Here, for example, is the way we would write 'spy.'*" Then write the words "spy" and "war," pointing out carefully where each letter comes from, and emphasizing the fact that the dot must be used in addition to the lines in writing any letter in the second or fourth diagram. Then add: "*I am going to have you write something for me; remember, now, how the letters go, first (pointing, as before) a b c, d e f, g h i, then j k l, m n o, p q r, then s t u v, then w x y z. And don't forget the dots for the letters in this diagram and this one*" (pointing). At this point, take away the diagrams, give S. pencil and paper, and tell him to write the words "come quickly." Say nothing about hurrying. Do not permit S. to reproduce the code and then to copy the code letters from his reproduction.

Credit if words are written within six minutes with not more than two errors, omission of dot counting as half error.

Alt. 1. Repeating Sentences.

Say, "*Now, listen. I am going to say something and after I am through I want you to say it over just as I do. Understand? Listen carefully and be sure to say exactly what I say.*" Repeat "*Say exactly what I say*" before reading each sentence. Do not re-read any sentence.

Credit if one sentence is repeated without a single error.

Alt. 2. Comprehension of Physical Relations.

(a) Draw a horizontal line 6 or 8 inches long. An inch or two above it draw a horizontal line about an inch long parallel to the first. Say, "*The long line represents the perfectly level ground of a field, and the short line represents a cannon. The cannon is pointed horizontally (on a level) and is fired across this perfectly level field.*" After it is clear that these conditions of the problem are comprehended, add, "*Now, suppose that this cannon is fired off and that the ball comes to the ground at this point here* (pointing to the farther end of the line which represents the field). *Take this pencil and draw a line which will show what path the cannon ball will take from the time it leaves the mouth of the cannon till it strikes the ground.*"

(b) Say, "*You know, of course, that water holds up a fish that is placed in it. Well, here is a problem: Suppose we have a bucket which is partly full of water. We place the bucket on the scales and find that with the water in it it weighs exactly 45 pounds. Then we put a 5-pound fish into the bucket of water. Now, what will the whole thing weigh?*" If S. responds correctly, say, "*How can this be correct, since the water itself holds up the fish?*"

(c) "*You know, do you not, what it means when they say a gun 'carries 100 yards?'* It means that the bullet goes 100 yards before it drops to amount to anything." When this is clear, proceed, "*Now, suppose a man is shooting at a mark about the size of a quart can. His rifle carries perfectly more than 100 yards. With such a gun is it any harder to hit the mark at 100 yards than it is at 50 yards?*"

Credit if two of the three problems are satisfactorily solved. (See book.)

XVIII—"Superior adult."**1. Vocabulary.**

See page 66.

2. Paper-Cutting Test.

Take a piece of paper 6 inches square and say, "*Watch carefully what I do. See, I fold the paper this way* (folding it once over in the middle). *Then I fold it this way* (folding it again in the middle, but at right angles to the first fold). *Now, I will cut out a notch right here*" (indicating). Cut notch, keeping fragments out of view. Leave folded paper exposed, but pressed flat against table. Then give S. a pencil and a second sheet of paper like the one already used and say, "*Take this piece of paper and make a drawing to show how the other sheet of paper would look if it were unfolded. Draw lines to show the creases in the paper and show what results from the cutting.*" Do not permit S. to fold second sheet, and do not say, "draw the holes."

Credit if creases are correctly represented, with correct number of holes correctly located.

3. Repeating Eight Digits.

Say, "*Now, listen. I am going to say over some numbers and after I am through, I want you to say them exactly as I do. Listen closely and get them just right.*" Give (a), and if necessary (b) and (c).

Credit if one set is reproduced without error.

4. Repeating Thought of Passage.

Say, "*I am going to read a little selection of about six or eight lines. When I am through I will ask you to repeat as much of it as you can. It doesn't make any difference whether you remember the exact words or not, but you must listen carefully so that you can tell me everything it says.*" Read (a), and if necessary (b), recording response verbatim. Urge S. to give thought of selection in his own words, if he hesitates.

(a) *Tests, such as we are now making, are of value both for the advancement of science and for the information of the person who is tested. It is important for science to learn how people differ and on what factors these differences depend. If we can separate the influence of heredity from the influence of environment, we may be able to apply our knowledge so as to guide human development. We may thus in some cases correct defects and develop abilities which we might otherwise neglect.*

(b) *Many opinions have been given on the value of life. Some call it good, others call it bad. It would be nearer correct to say that it is mediocre; for on the one hand our happiness is never as great as we should like, and on the other hand our misfortunes are never as great as our enemies would wish for us. It is this mediocrity of life which prevents it from being radically unjust.*

Credit if main thoughts of one of the selections are given in reasonably consecutive order. (See book.)

5. Seven Digits Backwards.

Say, "*Listen carefully, I am going to read some numbers, and I want you to say them backwards. For example, if I should say 5—1—4 you would say 4—1—5. Do you understand?*" Then, "*Ready now, listen carefully, and be sure to say the numbers backwards.*" If S. gives the digits forward, repeat instructions. If necessary, give (b) and (c), repeating each time: "*Ready now, listen carefully and be sure to say the numbers backward.*"

Credit if one set is repeated backwards without error.

6. Ingenuity Test.

State problem (a) orally, repeating it if S. does not respond promptly. Do not allow S. to use pencil or paper, and ask him to give his solution orally as he works it out. Record his statement in full. If S. resorts to some such method as "fill the 3-pint vessel two-thirds full," or "I would mark the inside of the 5-pint vessel so as to show where 4 pints come to," etc., inform him that such a method is not allowable; that this would be guessing, since he could

not be sure when the 3-pint vessel was two-thirds full, or whether he had marked off his 5-pint vessel accurately. Tell him he must measure out the water without any guesswork and explain also that it is a fair problem, not a "catch." Say nothing about pouring from one vessel to another, but if S. asks whether this is permissible, say "yes." If S. has not solved (a) correctly within five minutes, explain the solution in full and proceed to (b). State (b) orally and allow S. five minutes for its solution. Do not explain in case of failure. If S. succeeds on either (a) or (b), but not with both, give problem (c) orally, allowing five minutes for this also.

(a) *"A mother sent her boy to the river and told him to bring back exactly 7 pints of water. She gave him a 3-pint vessel and a 5-pint vessel. Show me how the boy can measure out exactly 7 pints of water, using nothing but these two vessels and not guessing at the amount. You should begin by filling the 5-pint vessel first. Remember, you have a 3-pint vessel and a 5-pint vessel, and you must bring back exactly 7 pints."*

Same formula for (b) and (c).

Credit if two of the three problems are solved correctly, each within five minutes.

Vocabulary.

"I want to find out how many words you know. Listen; and when I say a word, you tell me what it means. What is an orange?" etc. If S. can read, let him see the words on the vocabulary card. Continue list till 8 to 10 successive words are missed. If S. thinks formal definition is required, E. may say: *"Just tell me in your own words; say it any way you please. All I want is to find out whether you know what a ---- is."* E. may ask S. to explain what he means if it is not clear.

1 orange	26 noticeable	51 peculiarity	76 flaunt
2 bonfire	27 muzzle	52 coinage	77 declivity
3 roar	28 quake	53 mosaic	78 fen
4 gown	29 civil	54 bewail	79 ochre
5 tap	30 treasury	55 disproportionate	80 exaltation
6 scorch	31 reception	56 dilapidated	81 incrustation
7 puddle	32 ramble	57 charter	82 laity
8 envelope	33 skill	58 conscientious	83 selectman
9 straw	34 misuse	59 avarice	84 sapient
10 rule	35 insure	60 artless	85 retroactive
11 haste	36 stave	61 priceless	86 achromatic
12 afloat	37 regard	62 swaddle	87 ambergris
13 eyelash	38 nerve	63 tolerate	88 casuistry
14 copper	39 crunch	64 gelatinous	89 paleology
15 health	40 juggler	65 depredation	90 perfunctory
16 curse	41 majesty	66 promontory	91 precipitancy
17 guitar	42 brunette	67 frustrate	92 theosophy
18 mellow	43 snip	68 milksop	93 piscatorial
19 pork	44 apish	69 philanthropy	94 sudorific
20 impolite	45 sportive	70 irony	95 parterre
21 plumbing	46 hysterics	71 lotus	96 homunculus
22 outward	47 mars	72 drabble	97 cameo
23 lecture	48 repose	73 harpy	98 shagreen
24 dungeon	49 shrewd	74 embody	99 limpet
25 southern	50 forfeit	75 infuse	100 complot

NOTE.—To get the entire vocabulary, multiply the number of correct definitions by 180.

(b) ADAPTATION FOR USE WITH ILLITERATES.

In the examination of an illiterate subject only those tests in each year-group which are starred in the record booklet should be given. When only the starred tests are given, credits should be assigned in accordance with the following table:

Years 3 to 10.....	3	points (or months) per test.
Year 12.....	5	points (or months) per test.
Year 14.....	6	points (or months) per test.
Year 16.....	7½	points (or months) per test.
Year 18.....	9	points (or months) per test.

The probable error of a mental age score derived by the scale as thus abbreviated is approximately 7½ months, as contrasted with a probable error of less than 6 months for the unabbreviated scale as applied to unselected adults.

(c) EXPRESSING AND INTERPRETING RESULTS.

As this is an age scale, the responses are ordinarily scored in terms of months. They may also be scored in terms of points by those who prefer this method. When this is done, each test is given a point value corresponding to its value in months. A subject is credited with the full number of points for each test below the year-group actually given, *and in addition with 24 points for years 1 and 2.* He is also credited with the actual number of points scored in the year-groups given. It is thus possible to score as high as 30 points (months) in year XVI and 36 in year XVIII, making a total possible score of 234 points, or a mental age of 19 years, 6 months. If fewer than the regular number of tests are used from a given year-group, each test should be assigned a proportionately higher point value. If more than the regular number are used, each test should be assigned a proportionately lower value. Where half credit is allowed for a response, half the number of points is given.

The results of Stanford-Binet examinations are to be expressed in the following ways: (1) Mental age in years and decimal of a year; (2) letter rating.

Mental ages correspond to the letter ratings as follows:

A.....	18.	-19.5
B.....	16.5	-17.9
C+.....	15.	-16.4
C.....	13.	-14.9
C-.....	11.	-12.9
D.....	9.5	-10.9
D-.....		Below 9.5

Subjects obtaining a score of 10 years (120 points) or more may ordinarily be recommended for regular military training; subjects between 8 and 10 years (96 to 119 points) should be considered for assignment to service organization or Development Battalion; subjects below 8 years (96 points) should be considered for discharge.

Grade E should be given to all men who are recommended by the examiner for discharge, Development Battalion, or service organization, *and to such men only.* All men whose intelligence is deemed satisfactory for regular military duty shall be given rating of D— or higher.

4. PERFORMANCE SCALE EXAMINATION.

(a) PROCEDURE.

Test 1.—The Ship Test.

Materials.—A frame and ten pieces which, when properly fitted together, form a ship.

Directions.—E. shows S. the frame with the pieces properly fitted therein, and says: "*This is a picture of a ship. Look at it carefully.*"

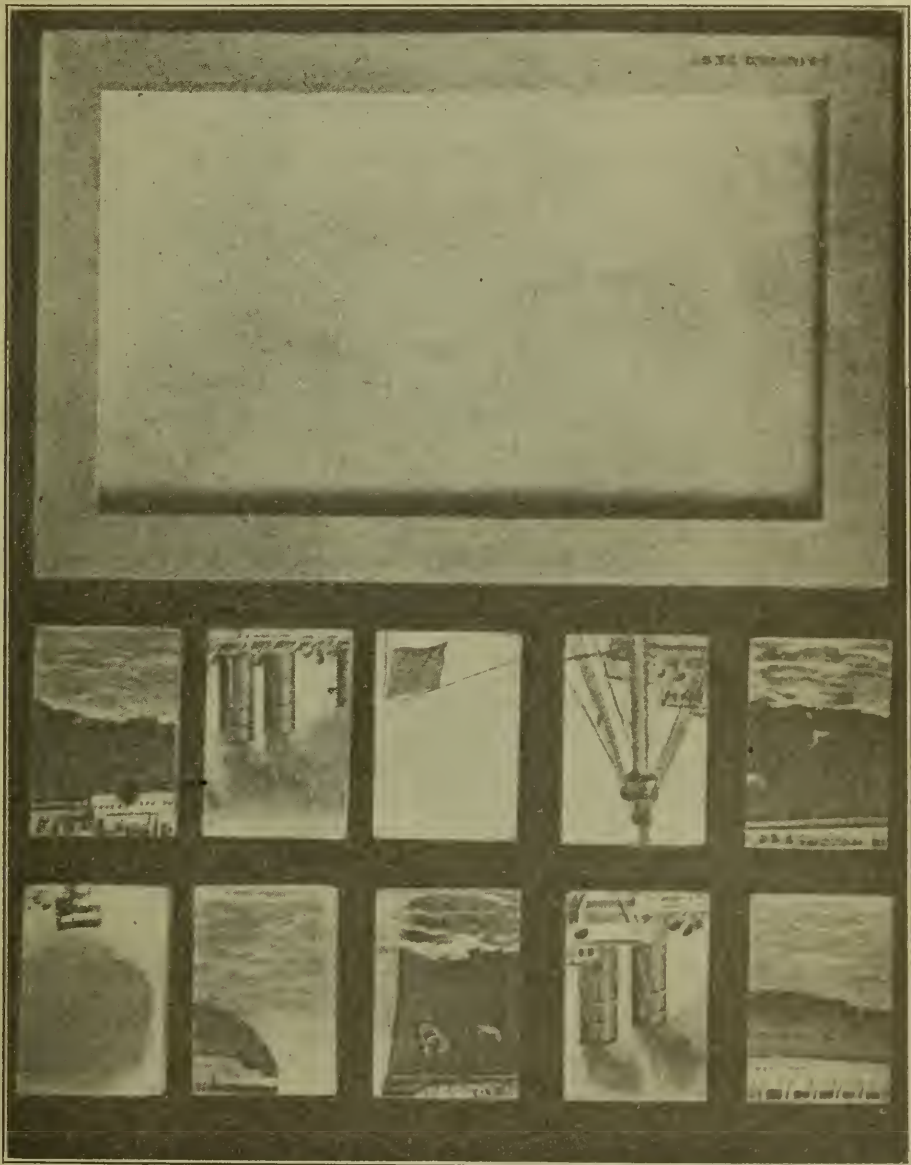


Figure 1.

S. is allowed to look at the picture for 10 seconds; then E. withdraws the picture from view, removes the pieces, and presents the empty frame and the pieces arranged as in Fig. 1. The pieces may be numbered on the edge toward E. from left to right to indicate

their positions. The frame is next the subject. E. says: "*Put these pieces in the frame as quickly as you can so as to make the ship you just saw.*"

S. is given *five minutes*, and is allowed to make any changes he wishes within the time limit; but E. must not suggest the changes.

Scoring.—A score of one is allowed for each of the lower or upper pieces, if placed in the lower or upper portion of the frame, i. e., the "water" pieces at the bottom and the "sky" pieces at the top, except that no credit is given for an inverted piece. In addition to this, a score of one is given to each piece that is in its correct relative position in the upper or lower row. The maximum score for accuracy is thus 20 points.

If the score for accuracy is 18 or more, additional credit is given for time as follows:

Time.	Credit.
0-20 -----	5
21-30 -----	4
31-50 -----	3
51-80 -----	2
81-120 -----	1
121-300 -----	0

The maximum raw score is, therefore, 25 points.

Test 2.—Manikin and Feature Profile.

Materials.—(a) Six pieces which when put together represent the conventional figure of a man.

(b) Eight pieces which when put together form the figure of a human head.

Directions.—(a) The pieces are placed before S., as in Fig. 2. Each arm and each leg is placed at the opposite side of the body from the place where it fits. E. says, "*Put this together as quickly as you can.*"

(b) The pieces are placed before S., as in Fig. 2. The three pieces forming the face are separated from each other by the four pieces forming the ear. E. says, "*Put this together as quickly as you can.*"

The time limit for (a) is *two minutes*, for (b) *five minutes*. Spontaneous changes are allowed within the time limit. S. is not told what the pieces make. If S. scores 3 or less on (a), E. fits it together correctly and then goes on to (b). If the score on (a) is 0, (b) need not be given.

Scoring.—The end products are scored as follows:

	Points.
(a) One point for each piece in correct position; i. e., for a perfect performance-----	5
One or both arms not exactly fitting joints-----	4
One reversal of arms or legs-----	3
Two reversals, arms and legs-----	2
Legs and arms interchanged, or any other result that looks like a man-----	1
Poorer than this, not resembling a man-----	0
(b) One point for each face piece in the correct position, 1 point for a partly correct ear—i. e., one, two, or three pieces in the correct place—and 2 points for a completely correct ear, making a total for accuracy of 5 points.	

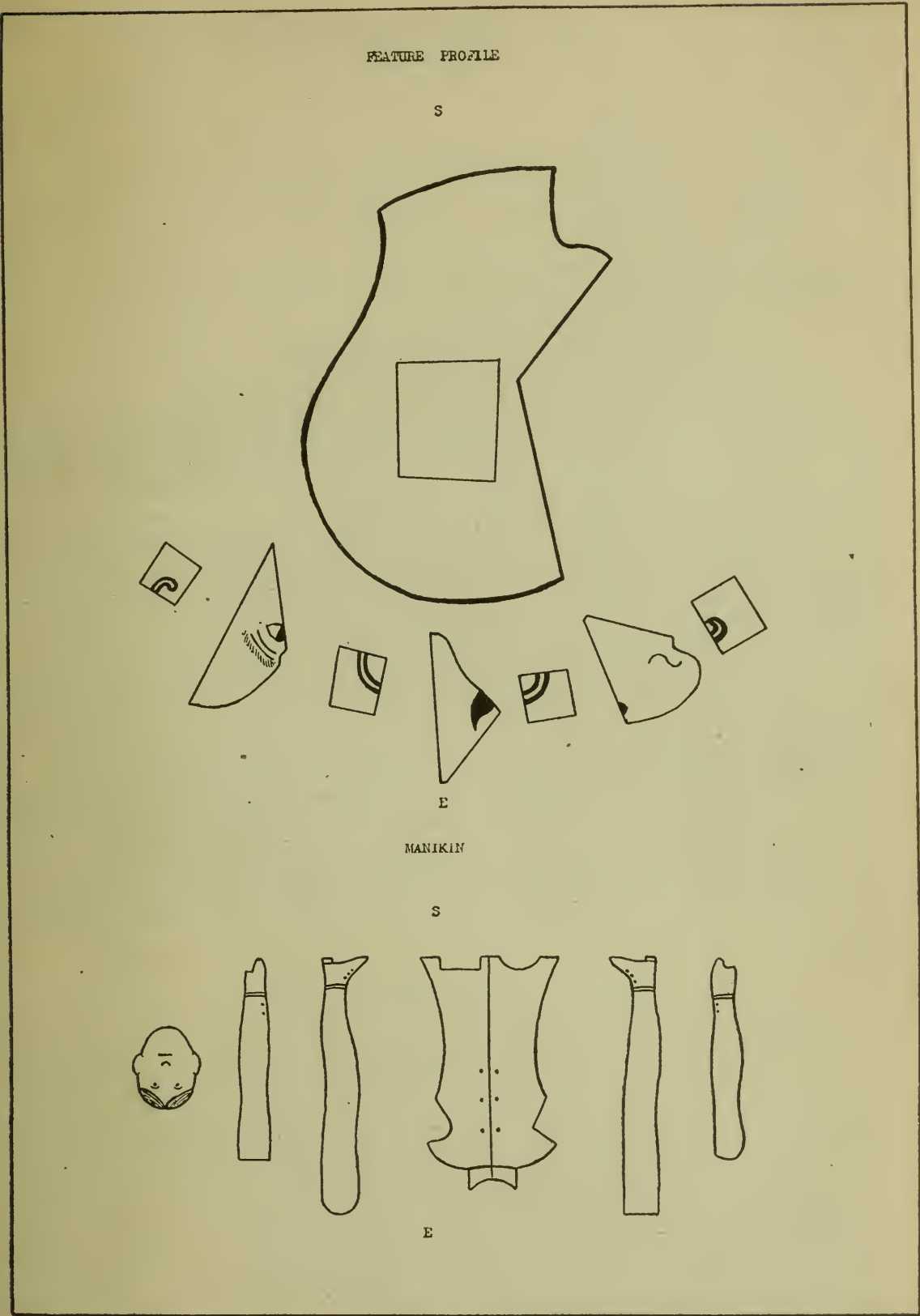


Figure 2.

Credit is given for time only if the score for accuracy is on (a) 4 or 5 points, on (b) 5 points. Then credit as follows:

Time.		Credit.
(a)	(b)	
0- 10	0- 30	5
11- 15	31- 40	4
16- 20	41- 60	3
21- 30	61- 80	2
31- 50	81-120	1
51-120	121-300	0

The maximum raw score is, therefore, 20 points on (a) and (b) together.

Test 3.—Cube Imitation.

Materials.—(1) Four 1-inch cubes fastened 2 inches apart to a wooden base. Both cubes and base are painted a dark red. The cubes are numbered 1 to 4 from right to left. (2) A fifth cube of the same size unattached and similarly painted. (3) Ten imitation problems (a to j), as printed on the record sheet.

Directions.—E. places the cube board before S., with the numbered side of the cubes directed away from him, and says: “*Watch carefully and then do just what I do.*” E. next with the fifth cube taps the attached blocks in a predetermined order, as, for example, in (a) 1—2—3—4, at the rate of *one per second*. He now lays the tapping cube down before S., midway between the second and third cubes, but nearer to S. than the cube board, and says: “*Do that.*” If in the first problem S. taps 4—3—2—1 instead of the reverse, E credits the response and says: “*No, begin here*” (pointing to 1).

Parts (b) to (j) are given in order unless S. fails in 5 successive parts. In this event the test is discontinued. It is important that the rate of tapping should not be faster than one per second.

Scoring.—The responses are recorded as right (+) or wrong (−); and 1 point is given for each success. The maximum raw score is 10 points.

Test 4.—Cube Construction.

Materials.—(1) A block of wood (model 1) 1 by 3 by 3 inches, painted a dark red on the four sides, not on the upper or lower surfaces, and cut to a depth of 2 mm., so that it closely resembles a composite of 9 small cubes. (2) Nine 1-inch cubes necessary for the construction of model 1, four painted on two sides, four painted on one side, and one not painted. (3) A block of wood (model 2), same size as model 1 but painted on the top as well as the four sides. (4) Nine 1-inch cubes necessary for construction of model 2. (5) A 2-inch cube (model 3), unpainted and cut on the six surfaces so that it looks like a composite of eight small cubes. (6) Eight 1-inch cubes painted on three sides for the construction of model 3.

Directions.—E. presents model 1, and says: “*You see this block. Notice that it is painted on the sides but not on the top or the bottom; and you see these smaller blocks (E. presents blocks described under (2), above) partly painted and partly unpainted. These nine blocks can be put together so as to make one just like this.*” E. puts the

blocks together, pointing to the painted surface or surfaces of each cube as he fits it in position.

(a) E. then presents the *same model* and blocks in irregular order, and says: "*Now, you fit the blocks together so as to make one like this.*"

(b) E. now presents model 2 and the blocks for its construction and says: "*Now, put these blocks together so as to make one just like this. Notice that it is painted on the edges and on the top but not on the bottom.*"

(c) E. presents model 3 and says: "*You see this block; notice that it is not painted anywhere; and you see these smaller blocks (present blocks described under (6) above) that have three sides painted and three not painted. Now, I want you to fit these eight blocks together so as to make one just like this. Remember, it is not painted on the bottom, top, or sides.*"

With a stop watch E. takes time in seconds for assembling the cubes. He also counts the number of moves. A move is to be understood as a *placement in some position designed to complete the structure*. If parts of a structure are assembled separately, putting such parts together does not count an additional move. If the blocks are fitted together in the hand, the moves are counted just as they are if assembled on the table. Turning a block over or otherwise shifting its position in the structure is counted a move, but turning it over in the fingers, picking it up, and placing it upon the table are not to be counted moves. S. is penalized sufficiently for such behavior by the longer time.

Time for work on each part, *two minutes*. If S. assembles blocks before time is up, allow spontaneous corrections, counting extra time and additional moves. Each block changed counts one move as before. The time should be taken when S. indicates verbally or otherwise that he has finished.

Scoring.—No credit is to be given for time, if the blocks are not all assembled; but if they are, credit as follows:

(a) Seconds.	(b) and (c) Seconds.	Credit.
1- 10	1- 20	5
11- 25	21- 30	4
26- 50	31- 50	3
51- 80	51- 80	2
81-120	81-120	1

No matter whether S. has finished or not, count each misplaced block as three additional moves and each unassembled block as six additional moves, and credit total moves as follows:

(a) and (b) Moves.	(c) Moves.	Credit.
9	8	5
10-11	9-10	4
12-15	11-15	3
16-25	16-25	2
26-50	26-50	1

Note that the minimum number of moves is nine for (a) and (b), and eight for (c); that no credit is given for over 50 moves; and that the maximum raw score is 10 points for each part, or a total of 30.

Test 5.—Form Board.

Materials.—See illustration of problems, Fig. 3, for identification of the materials.

Directions.—E. places the board before S., arranged as shown in "demonstration." "E." and "S." in this figure indicate the relative positions of examiner and subject. E. says: "*These blocks can be changed around so as to make room for this extra square, like this.*" E. proceeds to solve the problem in the minimum number of moves, making sure that S. is attending.

(a) E. now presents the board arranged for problem A, saying: "*Without making any more moves than you have to, change these blocks around so you can find a place for the extra square (pointing to square). Don't have any blocks left over. Ready—go ahead.*"

(b) E. now presents the board arranged for problem B, saying: "*I want you to change these blocks around so you can find places for these two extra squares (pointing to them). Ready—go ahead.*"

(c) E. presents the board arranged for problem C, saying: "*Now I want you to change the blocks around so you can find places for these four extra blocks. Ready—go ahead.*"

E. records the time in seconds from start to finish, and counts the number of moves. *A move is to be understood as placing or trying to place a block in some position on the board.* Taking a block out of position, and placing a block upon the table are not counted as moves.

Time for work on (a) and (b), *two minutes each*; on (c), *three minutes*. If (a) is not solved in the time allowed, E. demonstrates that correct solution before going on to (b).

Scoring.—If a problem is not solved within the time limit, score that part 0; but *if a correct solution has been accomplished*, give credit for time and for moves as follows:

MOVES.				TIME.			
(a)	(b)	(c)	Credit.	(a) and (b)	(c)		Credit.
-----	-----	8-----	5	0- 10	0- 20-----		5
-----	-----	9-----	4	11- 20	21- 40-----		4
3	5	10-11-----	3	21- 40	41- 70-----		3
4	6	12-14-----	2	41- 70	71-110-----		2
5-7	7-10	15-20-----	1	71-120	111-180-----		1

Note that the minimum number of moves for problems (a), (b), and (c) is 3, 5, and 8, respectively, and that the maximum raw scores are 8, 8, and 10, or a total of 26 points.

The examiner will find it advantageous to make a diagram of the arrangement of the blocks for each problem (as in Fig. 3), and paste it on the screen between him and the subject. He can then copy the pattern on the board out of view of the subject, and with a little practice, can do it very expeditiously—often in less than 30 seconds.

Test 6.—Designs.

Materials.—The five plates of designs on pp. 98 to 106. E. provides S. with pencil and paper.

Directions.—The designs are given in order, (a), (b), (c), (d). Formula for (a) and (b): "*I am going to show you a drawing. You will have just ten seconds to look at it; then I shall take it away*"

DEARBORN FORM BOARD No. 3.

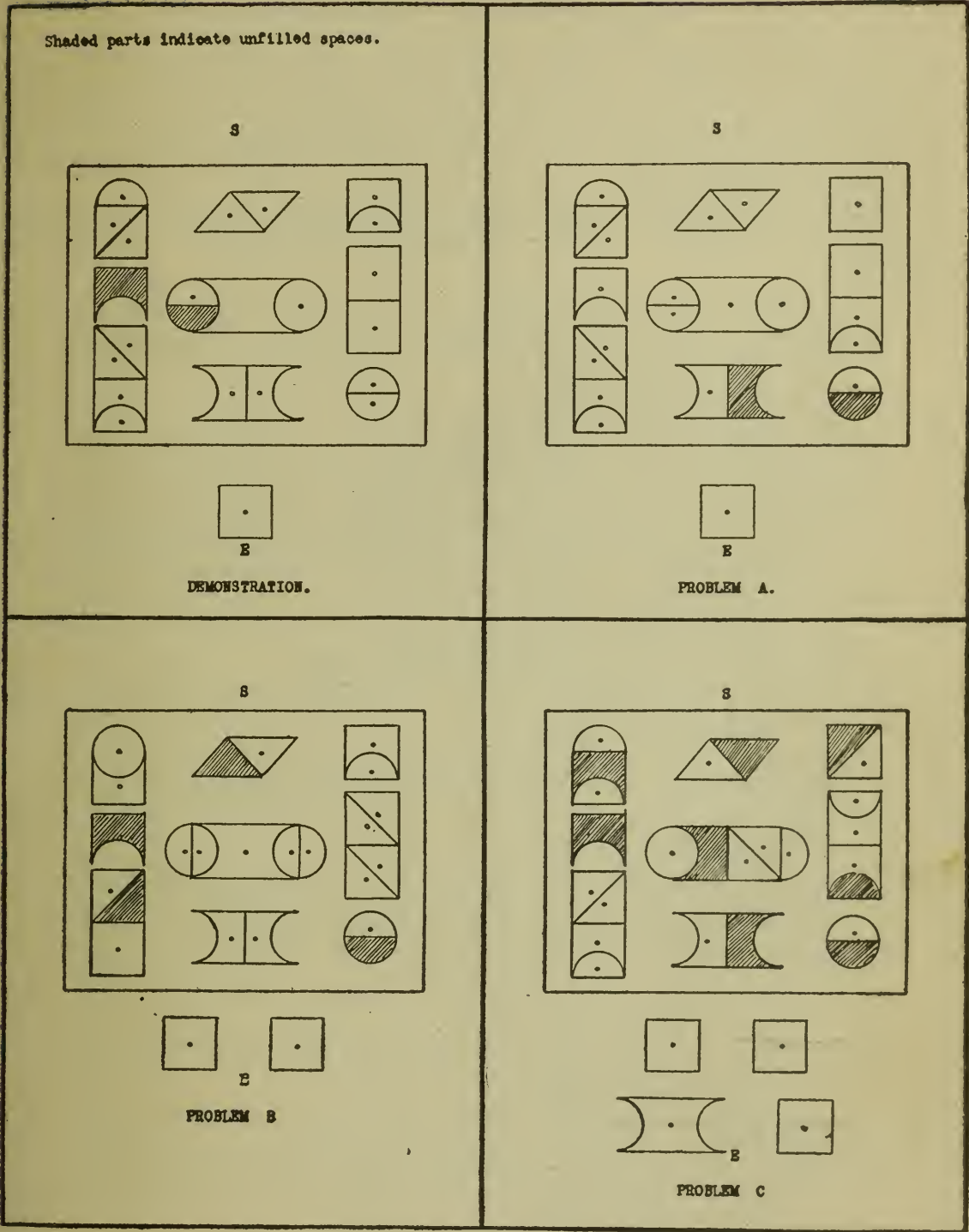


Figure 8.

and let you draw it from memory. Don't begin to draw till I say 'go.'"

Formula for (c) and (d): "This time I shall show you two drawings. You will have only ten seconds to look at them; then I shall take them away and you are to draw them both from memory."

Before exposing the designs, E. says: "Ready; look closely." When designs are removed, E. says: "Go." Designs are exposed with greatest length of page horizontal, and with front of Guide toward E. The time limit is 2 minutes, but S. is not stopped or penalized if he appears to have the correct plan and is carrying it out. If the raw score on (a), (b), and (c) together is less than 3, (d) need not be given.

Scoring.—Emphasis is put upon reproduction of the plan of the designs rather than upon the neatness of the drawing. Credit as follows:

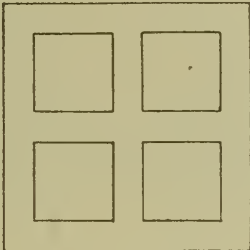
- | | |
|--|---|
| (a) 1. Two lines crossed, four flags ----- | 1 |
| 2. Correctly facing one another ----- | 1 |
| 3. Accuracy (lines nearly equal, nearly bisected, nearly at right angles; flags nearly square) ----- | 1 |
| Total possible points, 3. | |
| (b) 1. Large square with two diameters ----- | 1 |
| 2. Four small squares within a large square ----- | 1 |
| 3. Two diameters in each small square ----- | 1 |
| 4. Sixteen dots, each alone in a small square ----- | 1 |
| 5. Accuracy of proportion (width of spaces around the four small squares between $\frac{1}{4}$ and $\frac{1}{2}$ the width of the 16 smallest squares) -- | 1 |
| 6. If design is complete but with superfluous squares or lines, count only 3 points. | |
| Total possible points, 5. | |
| See Fig. 4 for some common variations. | |
| (c ¹) A rectangle with approximately vertical lines | |
| 1. Dividing it approximately equally (into not over 6 parts) ----- | 1 |
| 2. Dividing it into 4 parts ----- | 1 |
| Total possible points, 2. | |
| (c ²) A rectangle with approximately vertical lines | |
| 1. Dividing it into parts at least 3 of which diminish in size to the right ----- | 1 |
| 2. Dividing it into 6 parts ----- | 1 |
| Total possible points, 2. | |
| (d ¹) 1. Large diamond with small diamond inside crosswise with its vertices approximately coincident with obtuse angles of large diamond; or large diamond with small diamond inside with sides approximately parallel to those of large diamond (alternative to 1) ----- | 1 |
| 2. A third diamond with its vertices approximately coincident with the obtuse angles of the second ----- | 1 |
| 3. Accuracy (the proper lines very nearly parallel and the acute angles of diamonds all nearly equal) ----- | 1 |
| Total possible points, 3. | |
| (d ²) 1. A large square with sides approximately equal, and small square inscribed ----- | 1 |
| 2. A third square inscribed in second square approximately bisecting sides of second square ----- | 1 |
| Total possible points, 2. | |

The maximum raw score for entire test, 17 points.

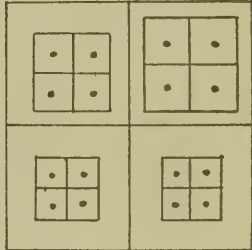
Scoring of Designs



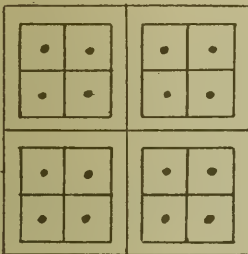
1 Point



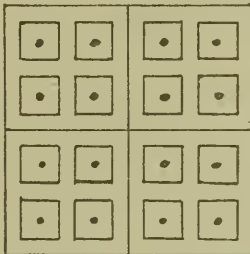
1 Point



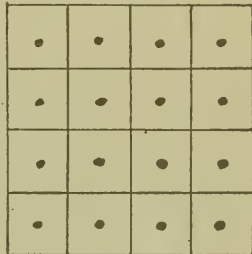
4 Points



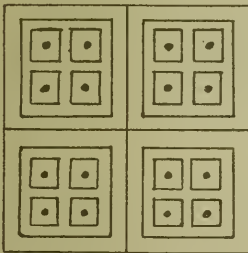
5 Points



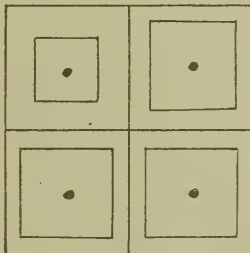
3 Points
(No Dots, 2 Points)



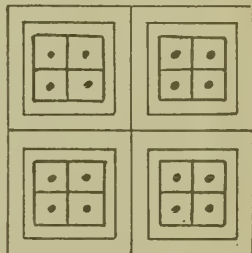
2 Points
(No Dots, 1 Point)



3 Points



2 Points



3 Points



1 Point



1 Point



2 Points



3 Points

Figure 4.

Test 7.—The Digit Symbol Test.

Materials.—See page 3 of record blank.

Directions.—The part of the first row marked *sample* is used for demonstration. E, says: "*You see these numbers and the little mark below each number* (pointing to the row at the top of the page). *Now, I want you to put in each one of these squares* (pointing to the empty squares in the three rows) *the little mark that ought to go there, like this: Below 2 put this little mark* (beginning at 2 in the sample), *below 1, this; below 3, this;*" etc. After doing five of the samples E pauses and asks: "*Now, what should I put here?*" indicating the next empty square). If S answers correctly, E finishes the samples himself; if S fails, E tells him and repeats the question with the next sample. After finishing the demonstration, E says: "*Now, you begin here and fill as many squares as you can before I call time.*"

Time, 2 minutes.

Scoring.—The score is the number of squares filled correctly in the time limit. Maximum raw score, 67 points.

Test 8.—The Maze.

Materials.—The four mazes (a), (b), (c), and (d) on page 4 of the record blank and maze (a) on page 3 for demonstration.

Directions.—E shows S demonstration maze and says: "*You see these lines. Now, I am going to begin here at S and mark with my pencil the shortest way out without crossing any lines. Watch carefully.*" E places sheet so that the bottom of the maze is toward S, and traces the way out, calling attention to the possibility of taking the wrong path at one or two of the critical points. E says: "*You see, if I should go this way, it would not be the shortest way out. I should have to turn back.*" E then presents test maze (a) on page 4 and says: "*Now, with your pencil begin at S and mark the shortest way out as quickly as you can. Do not cross any lines and do not turn back unless you have to. Ready—Go ahead.*"

If S crosses a line, not through carelessness, E says: "*You have crossed a line here. You see it is not an open space. Begin here* (indicating a point on the pencil mark just before it crossed the line) *and see if you can find a path out without crossing any lines.*" In scoring, S is penalized 1 point for each line crossed as above.

Mazes (b), (c), and (d) should be presented in the same way as (a) except that no further demonstration is allowed. Time limit for each maze, 2 minutes. If the score on (a) and (b) is 0, the test may be discontinued.

Scoring.—Time is recorded in seconds from start signal to successful exit. If this occurs within the time limit, credit for time is given for each maze as follows:

Time.	Credit.
0-20 -----	3
21-40 -----	2
41-70 -----	1
71-120 -----	0

Whether S finishes in the time limit or not, credit is given for the degree of success he has attained as follows: Each maze is divided

into five successive steps, which are indicated by dotted lines crossing the path of the maze in the key maze, Fig. 5. A credit of 1 point is given for each step successfully accomplished; i. e., for each imaginary dotted line crossed, making a total of 5 points for each maze. The openings of all blind alleys are indicated by heavy black lines across the path of the maze. A penalty of 1 point is given for each

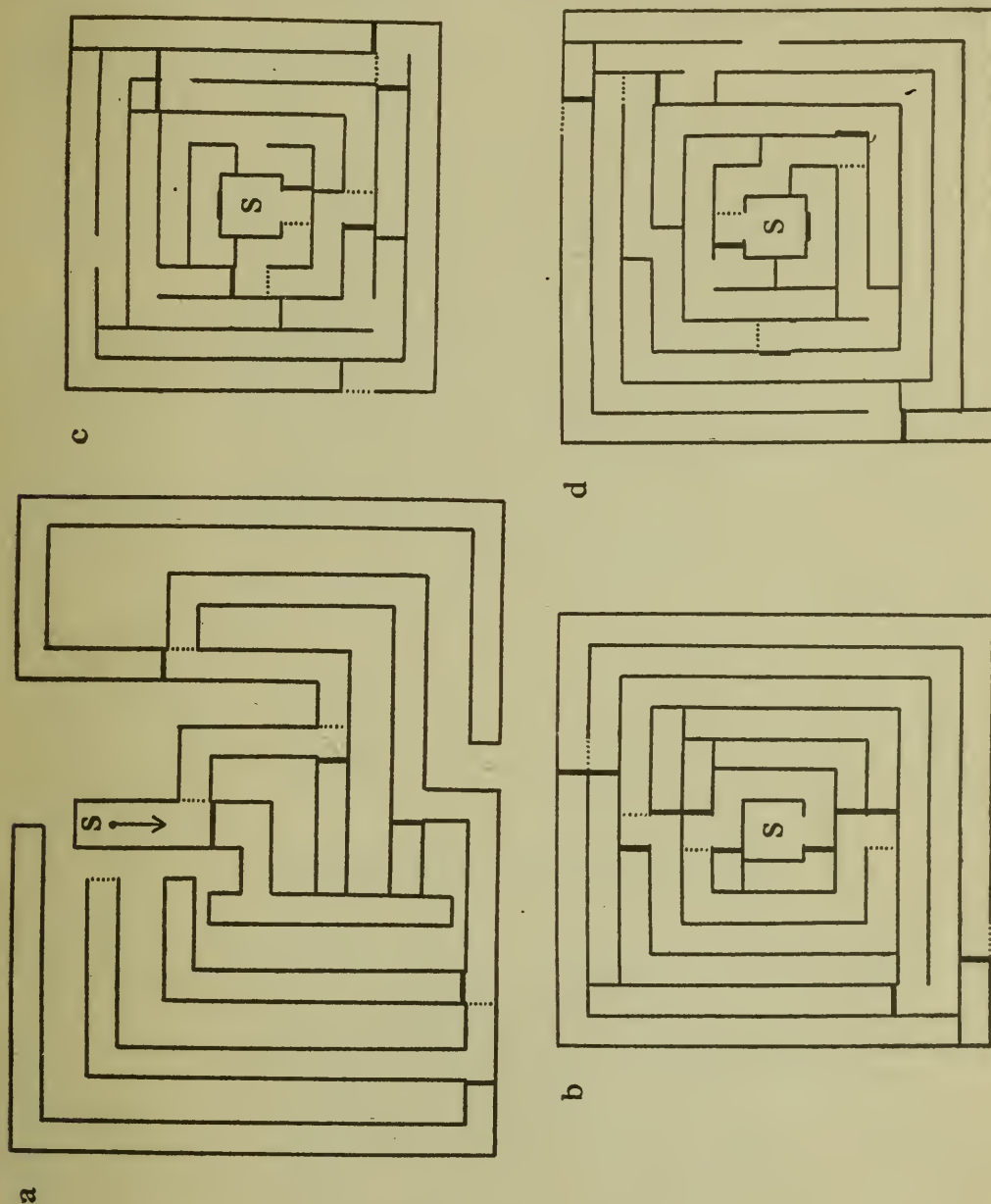


Figure 5. Key mazes.

imaginary heavy line crossed. Thus the *score equals the number of dotted lines crossed minus the number of heavy lines crossed, and maze lines crossed not through carelessness* (see above). Any negative score thus obtained counts as zero. (No matter how many times any dotted line or heavy line is crossed, only one credit or penalty is given therefor.)

Maximum raw score, 32 points.

Test 9.—Picture Arrangement.

Materials.—Five sets of "Foxy Grandpa" pictures, one set for demonstration, and four for actual tests.

Directions.—E. presents demonstrational set (α) in a row in the order 4—2—6—3—1—5 and says: "*These pictures tell a funny story if they are placed in the right order.*" E. then proceeds to arrange the pictures properly, telling the story as he does so, and calling subject's attention to the proper sequence of the important details. He next removes this set, and presents set (a), saying: "*Now see how quickly you can change these pictures around so as to make them tell a good story.*" S. is not told if he is wrong, but E. goes on to the next set. Sets (b) to (d) are presented in the same way. The sets are shown in a row in the order 4—2—6—3—1—5 and 5—1—3—6—2—4 alternately. The time limit for each set is *three minutes*.

Scoring.—E. records the time and the arrangement for each set; and gives a credit of 1 point for each pair of pictures in correct juxtaposition, i. e., a maximum of 5 points for accuracy for each set. When, however, the error in arrangement consists only in the reversal of one, two, or three juxtaposed pairs, a penalty of 1 point is given for each such reversal. Thus a credit of 4 points is obtained for arrangement 1—2—4—3—5—6, which would receive only 2 points credit for correctly juxtaposed pairs.

No credit is given for time unless the arrangement is correct. Then credit as follows:

Time.	Credit.
1- 30-----	3
31- 60-----	2
61-120-----	1
121-180-----	0

Maximum raw score, 32 points.

Test 10.—Picture Completion.

Materials.—Two boards upon which are depicted successive scenes from the day's activity of a boy; and 60 small blocks from which are selected the pieces to complete the pictures.

Directions.—The boards are placed before S., part 2 at his right. The 60 small pieces are placed above the boards in the box arranged in a *predetermined order* as indicated in the box. In this arrangement ambiguous pieces are located in the same area. E. says: "*Here is a picture—it begins here* (pointing to demonstration picture) *where the boy is getting dressed. It shows the same boy—remember, the very same boy—doing one thing after another during the same day.* (E. points along first row and then along second to indicate the sequence in which the pictures come.) *You see in each picture a piece is missing. Here are a lot of small pieces. They go into the empty places. You are to pick out the piece that you think is needed, that is best to make the picture right. For example, what is gone here?*" (pointing to demonstration picture). If S. answers correctly, E. says "*That's fine. Now see if you can find the best piece for each of the other places.*" If S. does not answer correctly, E. finds the piece for him, explains why it is right, and then says: "*Now see, etc.*"—as above. E. gives no help after the first explanation, but S.

is allowed to change pieces if he wishes. When S. indicates that he has finished as well as he can, time is recorded. The time limit is 10 minutes.

Scoring.—No credit is given for time, but the very slow are indirectly penalized by not finishing in the time limit. The scoring of the performance is indicated in the accompanying table. When a square is left unfilled, the score for that item is 0. Negative score on the entire test counts as zero.

Maximum raw score, 100.

Scoring of completion test.

[The value of *minus 5* is to be given to all placings where in the table below no numbers are inserted. These represent the marked absurdities.]

VALUE OF PIECES IN PICTURES.

Pieces	I	II	III	IV	V	VI	VII	VIII	IX	X
1.					2.					12.5
2.	0.	0.	1.	2.		0.	0.	0.	0.	0.
3.							1.	15		
4.					0.					6.
5.							0.	0.	0.	
6.	0.			0.						
7.	0.	0.	1.	2.		0.	0.	0.	0.	0.
8.	6.5			2.						
9.		5.	0.		0.					0.
10.	0.			1.						
11.	1.			8.						
12.		0.			0.					1.
13.		5.	0.		3.					1.
14.							1.	6.		
15.			1.			1.	0.	0.	0.	
16.							0.	0.	0.	
17.							1.	6.		
18.			6.			9.		9.		
19.		2.			0.					0.
20.										
21.		0.			1.					0.
22.					2.					6.
23.	1.			17						
24.					0.					6.
25.							2.	0.	0.	
26.			0.			4.	0.	0.	0.	
27.		5.	0.		1.					0.
28.			0.			4.	0.	0.	0.	
29.										0.
30.	2.			2.						
31.	1.			8.						
32.		0.			7					0.
33.							1.	7.		
34.							5.5	0.	0.	
35.			12.5		0.	0.				0.
36.			1.			2.	0.	0.	0.	
37.		0.	4.		0.	0.				0.
38.										0.
39.							0.	0.	1.	
40.										1.
41.		0.			2.					0.
42.	0.			2.						
43.		0.			2.					0.
44.			1.			1.	0.	0.	0.	
45.	3.			2.						
46.	0.	0.	6.	0.	0.	0.				0.
47.		5.	0.		1.					2.
48.							0.	0.	5	
49.		10	0.		1.					2.
50.	0.						0.	0.	1.	
51.	0.	0.	1.	2.		0.	0.	0.	0.	0.
52.	1.			8.						
53.	0.	0.	1.	2.		0.	0.	0.	0.	0.
54.							0.	0.	0.	
55.			6.		0.	0.				0.
56.							2.	0.	0.	
57.							0.	0.	1.	
58.	0.	0.	1.	2.		0.	0.	0.	0.	0.
59.							0.	0.	2.	
60.		0.	2.		0.	0.				0.

(b) PROCEDURE FOR NON-ENGLISH-SPEAKING SUBJECTS.

E. should take care that his directions do not appear too artificial. For this reason he should not always remain absolutely silent. He should try to use whatever words are intelligible to his subject. "No," "Yes," "Hurry," etc., can be used in most cases; and even when S. does not understand, it is often better for E. to speak as well as gesture. The aim here is only to make the instructions intelligible apart from the language used.

Test 1.—The Ship Test.

E. shows S. the frame with the pieces properly fitted therein. After S. looks at picture for 10 seconds, E. withdraws picture, removes pieces and presents the empty frame and the pieces arranged as in Fig. 1. E. points in order to S., to the pieces, to the frame, and nods affirmatively. If S. does not understand, E. repeats.

Test 2.—Manikin and Feature Profile.

E. places pieces before S. as previously described. Then points to S., to pieces, nods affirmatively, and sweeps hands together over pieces to indicate that they are to be assembled. This may be repeated. If S. does not understand, or if pieces are not properly assembled in the time limit, E. demonstrates part (a) and goes on to (b).

Test 3.—Cube Imitation.

E. places the cube board before S. as previously described; then taps the first imitation problem slowly, puts down the tapping cube, points to S., and nods affirmatively. If S. fails to understand, E. repeats; if he begins at the wrong end, E. shakes head negatively, points to the first cube, and repeats the problem. E. should make sure he has subject's attention before tapping any problem.

Test 4.—Cube Construction.

(a) E. presents model 1 and the corresponding blocks, points to bottom, top, and sides of model; then places it upon the table and assembles the blocks rather slowly, turning each block over in the fingers and pointing to painted and unpainted sides. E. now presents the same model and the blocks in irregular order, then points in order to S., to the model, to the blocks, and nods affirmatively. E. repeats, if S. does not understand.

(b) E. presents model 2 with the nine blocks for its construction; shows S. bottom, top, and sides of model; then places it upon the table, points to S., to the model, to the blocks, and nods affirmatively. E. repeats gestures, if S. does not understand.

(c) E. presents model 3, turns it over slowly, showing each side, presents blocks, picks up a block, points to painted side, shakes head, points to unpainted side, nods, puts down block, points to S., to model, and to blocks, nods affirmatively.

Test 5.—Form Board.

E. places board before S. as previously described, points to square and to empty spaces, and proceeds slowly to change blocks and put in square. E. next removes board, rearranges it for problem (*a*), and again presents it to S. He then points to S., to square, and to board, nodding affirmatively. If S. does not understand, E. repeats gestures; and if problem is not solved in the time limit he again demonstrates the correct solution and passes on to (*b*). Problems (*b*) and (*c*) are presented in the same way except that they are not demonstrated in case of S.'s failure.

Test 6.—Designs.

E. shows S. demonstrational design (*x*) for 10 seconds. Then he takes it away and draws it for S. He now shows test design (*a*) for 10 seconds; then takes it away, gives S. pencil and paper, points to S., to paper, nods affirmatively. If S. does not respond, E. draws it for him, then passes on to (*b*). Designs (*b*), (*c*), and (*d*) are presented in the same way except that E. does not demonstrate further.

Test 7.—Digit Symbol.

E. shows S. the record sheet, points to blank below 2 in the sample, then to symbol for 2 at top of page, writes in symbol, proceeds in the same way with the other parts of the sample, then gives S. pencil, points to space below 3 in the test, and nods affirmatively.

Test 8.—The Maze.

E. shows S. demonstration maze (*a*), and with his pencil proceeds to trace the shortest way out. At critical points he hesitates, moves pencil in wrong direction without marking, shakes his head, and continues to work in the right direction. He next presents test maze A, gives S. pencil, points to starting point and to exit of maze, and nods affirmatively. If S. fails to understand, E. demonstrates again with maze A and passes on to (*b*). Mazes (*b*), (*c*), and (*d*) are presented in the same way, but no more demonstration is given.

Test 9.—Picture Arrangement.

E. presents demonstrational set and allows S. to see it for about 15 seconds. Then, making sure that S. is attending, he slowly rearranges the pictures and points to each one in succession, attracting subject's attention especially to the sequence of important details. Next E. removes these pictures and presents set (*a*), points to S., and moves his hand about the pictures to indicate that they are to be arranged. If S. does not understand, E. shows him the proper arrangement and then goes on to set (*b*). Sets (*b*), (*c*), and (*d*) are presented in the same way as (*a*), except that no further demonstration is given if S. fails.

Test 10.—Picture Completion.

E. places material before S. as previously described. He then slowly points to the same boy in each of the pictures in succession to indicate the proper sequence of events. He next returns to the dem-

onstrational picture, points to dressed and undressed foot and to empty space. Next he looks leisurely over the small blocks, tries the slipper or the low shoe in the space, points to dressed foot, and shakes his head negatively. Then he puts in the correct piece showing satisfaction with result. Finally, he points in order to picture 1, to S., to small blocks, and to the empty space in the picture, and nods affirmatively. If S. does not understand, E. repeats.

(c) DIRECTIONS FOR USING RECORD BLANK.

In general, the subject is given credit for both speed and accuracy or degree of success; and the record blank is designed to convert time and accuracy measurements into points of credit without delay or inconvenience.

As soon as S. has completed tests 1, 2, 4, 5, 8, or 9, or any part of any one of them, E. checks the space containing the figures which include the subject's time. In tests 1, 2, and 9, he next scores the performance for accuracy; and, if the conditions for crediting time are fulfilled, he adds the credit below the time checked to the credit for accuracy and records the sum in the column marked "score." In tests 4 and 5, E. also checks the space which includes the number of moves; and, if the conditions for crediting are fulfilled, he adds the credit below time checked to the credit below moves checked and records the sum in the column marked "score," as above. In test 8 time is checked and the credit for time added to the credit for success, etc., as before. The abbreviations T. L. in these tests means "time limit"; and this space is checked only when S. is actually stopped before the test or part of the test is completed.

In test 3, E. records the response only when it is incorrect; but always writes + or - in the proper column. In test 10, the number on the back of the block selected for a given picture is written below the number of the picture, and the credit for that part is written in the next space below. If no block is selected for any given picture, E. leaves that space blank. Tests 6 and 7 require no explanation.

The score for each part of tests 2, 4, 5, 8, and 9 are written in the column marked "score"; and then these part scores are totalled below the heavy line, except in test 2, where the total for the two parts is merely written at the foot of the space for score. In all other tests only the total score for the test is written in the "score" column.

(d) DIRECTIONS FOR WEIGHTING PERFORMANCE-SCALE SCORES.

The raw score for each of the 10 tests is converted into a weighted or equalized score, which is entered on the performance-scale record blank and on the psychological record card in the column headed: "Wtd. score." This weighted score is obtained by means of the accompanying table. In the table all the possible raw scores for each test are listed in columns bearing the number of the test. The weighted scores corresponding are listed in the columns under the letter "W" at either side of the page. For example, to convert a raw score, in test 1, into a weighted score, look at the column under figure 1, find the raw score, and take the score in either column W which is on the same line. Thus, the weighted score corresponding to the raw score 19, in test 1, is 13. The weighted score corresponding to the raw score 35, in test 7, is 15, etc.

Table for weighting performance scale scores.

W.	1	2	3	4	5	6	7	8	9	10	W.
0	0-3	0-1	0	0-1	0-2	0	0	0-3	0-1	0	0
1	4-6	2	.....	2	3-5	1	1-4	4-7	2	.....	1
2	7-9	3	1	3	6-7	2	5-7	8-10	3	.....	2
3	10-11	4	.....	4	8	.....	8-10	11-13	.....	.....	3
4	12	5	.....	5	9	3	11-13	14-15	4	1-2	4
5	13	6	2	6	10	.....	14-15	16	.....	3-5	5
6	14	.....	.....	7	11	4	16-17	17	5	6-8	6
7	15	7	.....	8	.....	.....	18-19	18	.....	9-11	7
8	16	8	.....	9	12	5	20-21	19	6	12-14	8
9	17	.....	.....	.....	.....	.....	22-23	.....	.....	15-17	9
10	.....	9	3	10	13	.....	24-25	20	7	18-20	10
11	18	.....	.....	11	14	6	26-27	.....	8	21-23	11
12	.....	10	.....	.....	.....	.....	28-29	21	9	24-26	12
13	19	.....	.....	12	15	7	30-31	.....	10	27-30	13
14	.....	11	.....	13	.....	.....	32-33	22	11	31-33	14
15	20	.....	4	.....	16	8	34-35	.....	12-13	34-37	15
16	.....	12	.....	14	.....	.....	36-37	23	14-15	38-40	16
17	21	.....	.....	15	17	9	38-39	.....	16-17	41-44	17
18	.....	.....	.....	.....	.....	.....	40-41	24	18	45-47	18
19	.....	13	5	16	18	10	42-43	.....	19	48-50	19
20	22	.....	.....	17	.....	.....	44-45	.....	20	51-53	20
21	.....	14	.....	.....	19	11	46-47	25	21	54-56	21
22	.....	.....	.....	18	20	.....	48-49	.....	22	57-59	22
23	23	15	6	19	.....	12	50-51	26	23	60-62	23
24	.....	16	.....	20	21	.....	52-53	.....	24	63-65	24
25	.....	.....	.....	21	22	13	54-55	.....	25	66-68	25
26	.....	17	7	22	.....	.....	56-57	27	26	69-71	26
27	24	18	.....	23	23	14	58-59	.....	27	72-74	27
28	.....	.....	.....	24-25	24	.....	60-61	28	28	75-77	28
29	.....	19	8	26-27	.....	15	62-63	29	29	78-80	29
30	25	20	.....	28-30	25	16	64-65	30	30	81-86	30
31	.....	.....	9	.....	26	17	66-67	31	31	87-92	31
32	.....	.....	10	.....	.....	.....	.....	32	32	93-100	32

(e) AN ABBREVIATED PERFORMANCE SCALE.

If time does not permit the giving of the complete performance scale, a short scale selected from tests 1, 2, 3, 4, 6, 7, and 8 may be used. These tests must be given in the following order: 7, 6, 2, 4, 8, 1, 3 (or 3, 1). After each test is given E. should compute the weighted score obtained by S. up to that point; and he may discontinue the examination after the first test, if the score is 14 or more; after the second, if it is 22; after the third, if it is 27; and after the fourth, if it is 32. The fifth test should be given if the score on four tests is less than 32; but only very rarely need more than five tests be used.

If S. is absolutely illiterate (whether American or foreign born), E. should begin with test 6 instead of 7, and follow the same procedure.

If the examination is discontinued after the first test, S. should be rated D (C—, if the score is 21 or more) and as a rule recommended for regular service. If two or more tests are given, a final

score should be obtained by finding the average for the tests actually given and multiplying by 10. The letter rating for this score can then be read from the table of norms for the *short scale*. If eight or more tests are given, the norms for the long scale should be used.

(f) EXPRESSING AND INTERPRETING RESULTS.

The results of the performance-scale examination should be expressed in the following ways: (1) Total weighted score; (2) letter rating; (3) mental age. The letter ratings corresponding to various scores and mental ages are as follows:

Complete scale.	Short scale.	Mental age.
3	2	4.5
4	5	5
6	8	5.5
9	12	6
17	17	6.5
30	24	7
41	33	7.5
52	42	8
62	53	8.5
72	67	9
91	86	9.5
114	108	10
135	127	10.5
153	144	11
166	158	11.5
175	169	12
183	179	12.5
189	188	13
195	197	13.5
201	205	14
208	214	14.5
216	223	15
223	232	15.5
230	241	16
237	250	16.5
244	259	17
251	267	17.5
258	275	18
268	283	18.5
290	291	19

Letter ratings should be assigned as follows:

	Complete scale.	Short scale.
A-----	260-311	275-308
B-----	240-259	250-274
C+-----	215-239	220-249
C-----	190-214	190-219
C------	150-189	145-189
D-----	90-149	85-144
D- -----	0- 89	0- 84

Grade E should be given to all men who are recommended by the examiner for discharge. Development Battalion, or service organization, *and to such men only*. All men whose intelligence is deemed satisfactory for regular military duty shall be given rating of D— or higher.

Subjects obtaining a score of 100 points or more (short scale) may ordinarily be recommended for regular military training; subjects obtaining 40 to 99 points should be considered for assignment to service organization or Development Battalion; those below 40 points should ordinarily be considered for discharge.

5. MECHANICAL-SKILL TEST.

The mechanical test is intended for use (1) in aiding decision in doubtful cases under individual consideration, and (2) as a special test of mechanical skill.

Materials.—One set mechanical test (Stenquist), single series 1.

Instructions.—Place the open box before S. with the cover toward him. Say, “*Here are some things that have been taken apart. You are to put them together. Begin here [pointing to A]; take the parts and put them together so that the thing will work. Then go on to this one [pointing to B]; then to the next, and so on. If you come to one that seems very hard, go on to the next one; and if there is time later try it again. The more things you get done the larger your score. Ready—Go.*”

Time for the entire test. *30 minutes.*

Scoring.—Give 10 points for the complete and correct assembling of each object. Total possible score, 100.

If the assembling of any object is only partially correct, give partial credit, according to the schedule. A list of the possible steps in the assembling is given for each object. Note in each case of partial solution which steps have been completed, and give credit for each step as indicated. The items included in a brace are alternative reactions, therefore give credit of only one number of points from any brace.

It will be noted in D, for example, that, failing only to screw cover on, S. gets but 6 points, while screwing the cover on counts but 1 point. The additional 3 points of penalty are for lack of “workability.” If any step is omitted in the solution of any object except E, then item of “workability” is considered as lacking. In E, however, credit of 2 points is given for workability if the solution is correct except only 2 sides snapped or caps out of order, or both.

In case of the lock, the spring is properly inserted when the bend is hooked over the projection in the frame to prevent slipping. By “Spring inserted workably” is meant one of the three other workable positions in which it is possible to place the spring, but which make no use of the bend.

In the case of the mousetrap, by “in slot” is meant that the long arm of the spring is inserted in the slot of the U-shaped band. By “Right way.” reference is made to the direction in which the U-shaped band snaps. A “weak snap” is occasioned by having the spring or springs inverted. If one spring is more nearly correctly inserted than the other, count best one; that is, give credit for the best spring, and for that only, except in the last case.

Schedule of scores.

A:		G:	
Head inserted correctly-----	2	Small lever in place-----	2
Nut screwed on—		Lock bolt in place-----	1
Properly between cross		Spring inserted—	
bars of handle-----	4	Workably-----	4
Otherwise-----	1	Properly-----	5
Score (wrench)----- ()		Top fitted on properly and	
B:		screw inserted-----	1
Complete chain of singly joined		Score (lock)----- ()	
links-----	3	H:	
One correct joint between		Both levers backward-----	1
links-----	2	One forward clear in, other	
Two correct joints-----	4	backward-----	3
Three correct joints-----	6	Other part way in, for-	
Four correct joints-----	8	ward-----	4
Score (chain)----- ()		Both part way in, forward---	5
C:		Both clear in, forward, one	
Thumb lever inserted in arm-		facing wrong-----	8
holes—		Both facing wrong-----	9
Below spring, arm of lever		Score (paper clip)----- ()	
out-----	3	I:	
Above spring wrong side		Button properly inserted in	
forward-----	8	upper ring-----	2
Score (tube shut off)- ()		Circuit-closing disk properly	
D:		fitted in bottom ring-----	2
Thumb lever on pin either way-	1	Rings snapped together-----	3
Gear on pin right side up in		Score (electric button)- ()	
mesh with lever-----	1	J:	
Knockers right side up in mesh		U-shaped band held in proper	
with gear-----	2	place by pin or wire-----	1
Cover screwed on-----	1	Trip lever on pin—	
Spring hooked-----	2	Improperly-----	1
Score (bell)----- ()		Properly-----	2
E:		Wire lever hooked—	
Center stud in place-----	2	Improperly-----	1
Springs in place-----	1	Properly-----	2
Caps in place—		Springs on pin (count best	
Out of order-----	1	one)---	
In order-----	3	Weak snap, not in slot,	
Cover snapped—		either way-----	1
Two sides-----	1	Weak snap, in slot, either	
Three sides-----	2	way-----	2
Workability-----	2	Strong snap, in slot, wrong	
Score (coin box)---- ()		way-----	3
F:		Strong snap, in slot, right	
Spring correctly placed on one		way,	
stick-----	2	One spring-----	4
Imperfect usable clothespin—		Both springs-----	5
Unsymmetrical-----	4	Score (mouse trap)- ()	
Symmetrical-----	6		
Score (clothespin)---- ()			

ABBREVIATED MECHANICAL TEST.

The abbreviated mechanical test includes only items A, B, D, E, and G of the complete test. Time, 15 minutes. Score each item according to directions given above and double their sum to secure the total score.

Table of norms.

(Derived from 909 cases; 303d Engineers, Camp Dix.)

Score.	Percentile rank, per cent.
0 -----	0
10 -----	1.5
20 -----	6
30 -----	12
40 -----	22
50 -----	37
60 -----	53
70 -----	69
80 -----	83
90 -----	94
98 -----	100

Letter rating.	Score.
A -----	96-100
B -----	80-95
C -----	40-79
D -----	20-39
E -----	0-19

APPENDIX A.

Table of equivalent scores.

Alpha.	Beta.	Point scale.	Complete performance.	Short performance.	Stanford-Binet.
			3	2	4.0
			4	5	4.5
			6	8	5.0
			9	12	5.5
		31.5	17	17	6.0
		36	30	24	6.5
	2	42	41	33	7.0
	6	46	52	42	7.5
2	11	51	62	53	8.0
4	17	55.5	72	67	8.5
7	24	60	91	86	9.0
11	30	64	114	108	9.5
16	37	68	135	127	10.0
21	42	71	153	144	10.5
27	47	74	166	158	11.0
33	53	77	175	169	11.5
40	58	79	183	179	12.0
47	63	81	189	188	12.5
56	67	83	195	197	13.0
63	71	85	201	205	13.5
71	75	87	208	214	14.0
78	78	88	216	223	14.5
85	81	90	223	232	15.0
93	84	92	230	241	15.5
102	88	95	237	250	16.0
114	91	98	244	259	16.5
125	95	100	251	267	17.0
137	99		258	275	17.5
147	104		268	283	18.0
161	108		290	291	18.5
					19.0

Basis for the assignment of letter grades.

	Alpha.	Beta.	Point scale.	Whole performance.	Short performance.	Stanford-Binet.
A....	135-212	100-118	Not given.	260-311	275-308	18 -19.5
B....	105-134	90- 99	95-100	240-259	250-274	16.5-17.9
C+..	75-104	80- 89	90- 94	215-239	220-249	15 -16.4
C....	45- 74	65- 79	80- 89	190-214	190-219	13 -14.9
C....	25- 44	45- 64	70- 79	150-189	145-189	11 -12.9
D... .	15- 24	20- 44	60- 69	90-149	85-144	9.5-10.9
D- .	0- 14	0- 19	0- 59	0- 89	0- 84	0 - 9.4

APPENDIX B.—EXAMINER'S OUTFIT.

I. A supplementary outfit is furnished at the commencement of camp examining to provide for the immediate needs of the staff. This outfit includes:

- (1) 6 gross lead pencils.
- (2) 3 pencil sharpeners.
- (3) 2 typewriters.
- (4) 2 typewriter tables.
- (5) 1 chest of tools.

Additions to and replenishment of these materials must be secured regularly from the medical supply officer by requisition through the division or camp surgeon.

II. Psychological equipment, as such, consists of three groups:

- (A) Group examining outfit.
- (B) Individual examining outfit.
- (C) Printed materials.

The regular procedure for increasing or replacing these supplies is a request through military channels addressed to the Surgeon General of the Army, attention Division of Psychology.

The various items under psychological equipment are listed below.

(A) Group examining:

1. Beta outfit—
 - (a) Blackboard frame.
 - (b) Beta chart.
 - (c) 6 cardboard pieces, test 7.
2. Alpha stencils for each form.
3. Beta stencils.

(B) Individual examining:

1. Point-scale materials.
2. Stanford-Binet materials.
3. Performance-scale materials—
 - (a) Ship test.
 - (b) Manikin.
 - (c) Feature profile.
 - (d) Cube construction.
 - (e) Cube imitation.
 - (f) Form board.
 - (g) Picture arrangement.
 - (h) Picture completion.
4. Mechanical skill test.

(C) Printed materials:

1. Group examination Alpha, five forms.
2. Group examination Beta.
3. Point-scale examination.
4. Stanford-Binet examination.
5. Performance-scale examination.
6. Psychological record.
7. Report of psychological examination.
8. Examiner's guide.

APPENDIX C.—BUILDING AND EQUIPMENT.

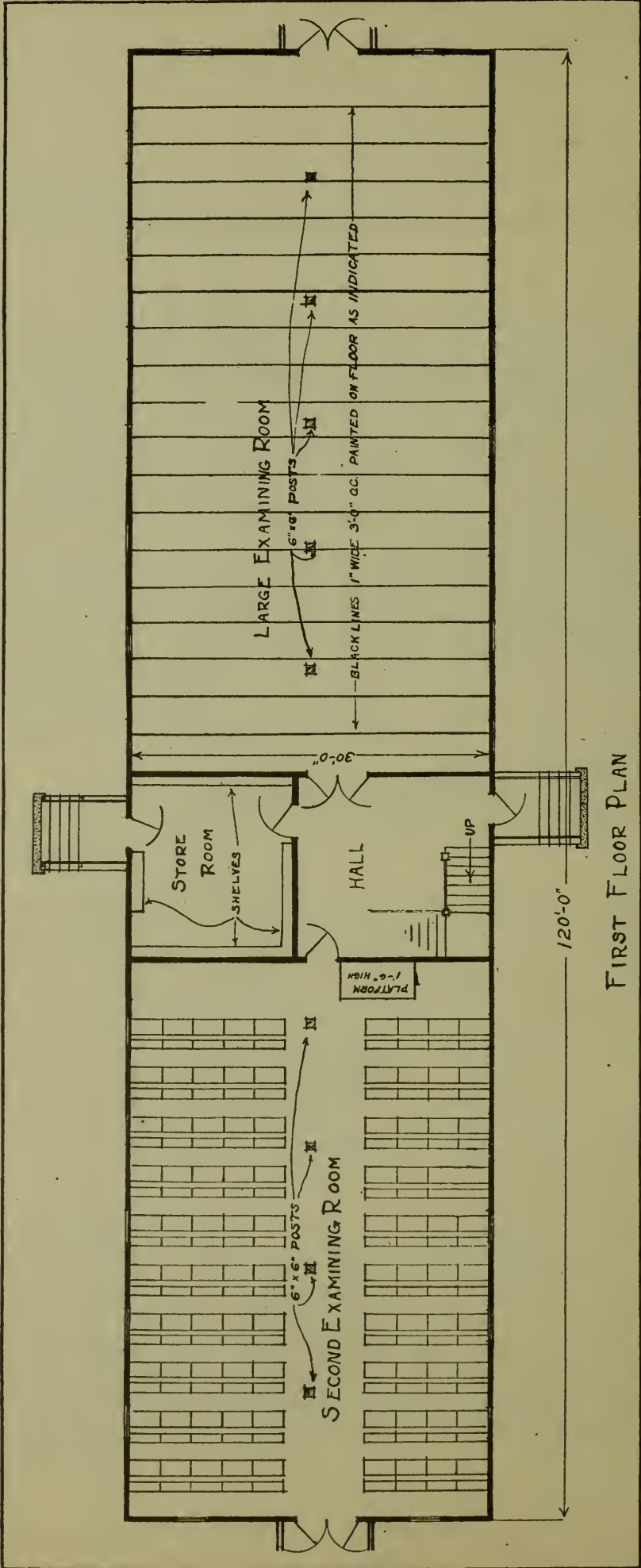
Following authorization by the Secretary of War for construction in each camp of special psychology building, it was decided to secure, wherever possible, the assignment of small barracks building, and to remodel the same for psychological use. Suitable building for psychological examining has been designated in many of the divisional training camps. In others, temporary arrangements have been effected. For the use of the school of military psychology, Medical Officers's Training Camp, Fort Oglethorpe, Ga., a special psychology building has been constructed.

In general, it is desirable that building for psychological examining be located conveniently near receiving and examining station of camp, and if possible also near the personnel office and the office of the camp surgeon and psychiatrist. Where there is a depot brigade the building should be either in or near the same. Since the psychologist will have important functions in connection with the development battalion, it also should be considered in selecting location for psychological work.

For the information of examiners and their guidance in selecting and planning for the remodeling of such building as they may secure for their work, the plans of special psychology building are reproduced herewith.

In planning modifications for any assigned building, it is well to keep in mind the fact that other uses than psychological examining will be found for the psychological building. In the original plan it was intended that the Division of Psychiatry should also have an office in the building and, where necessary, sufficient examining space for individual examinations and consultation. In certain of the camps plans are already on foot to use this building for medical conferences, for conferences between psychiatrists, psychologists, and line officers, for addresses to the line officers on morale, and for discussions and conferences on methods of instruction, and training of the new recruit.

The first floor of the original building was planned to contain Alpha and Beta examining rooms and a storeroom for heavy materials. The Alpha examining room was planned to seat on the floor 160 to 200 men. This room was without benches, but the necessary space for each man is marked out roughly by lines running crosswise of the length of the room. These lines were spaced 3 feet apart. Since the men were to be seated on the floor or on small wicker mats, it was deemed desirable to make the floor of this room of double thickness. A small reading stand with shelves was planned for the



FIRST FLOOR PLAN

Figure 6.

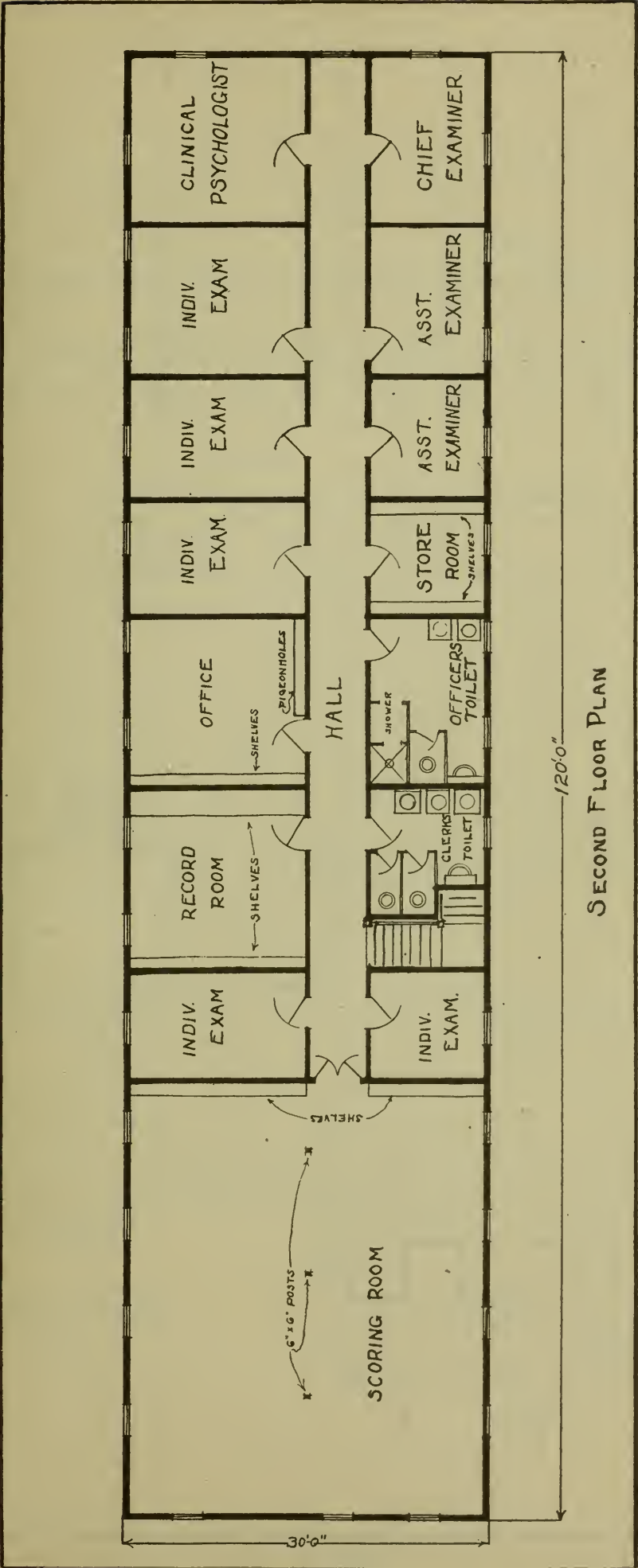
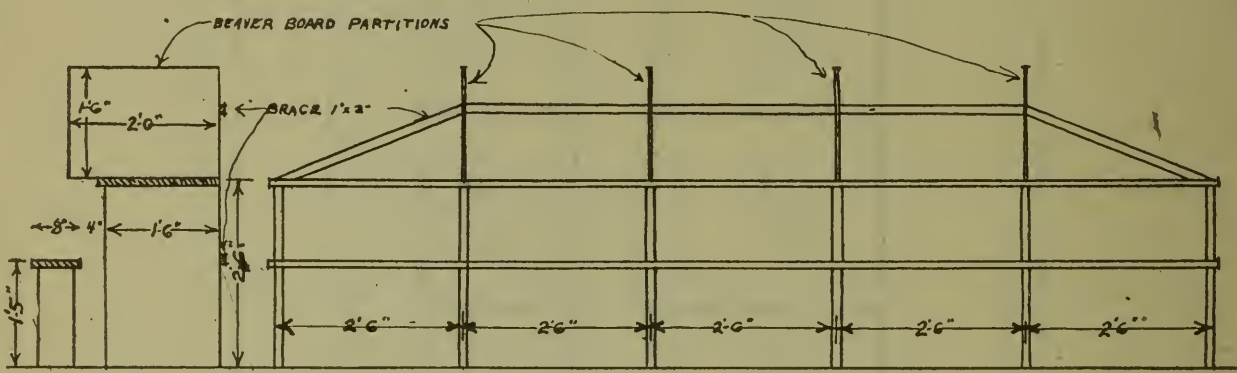


Figure 7.

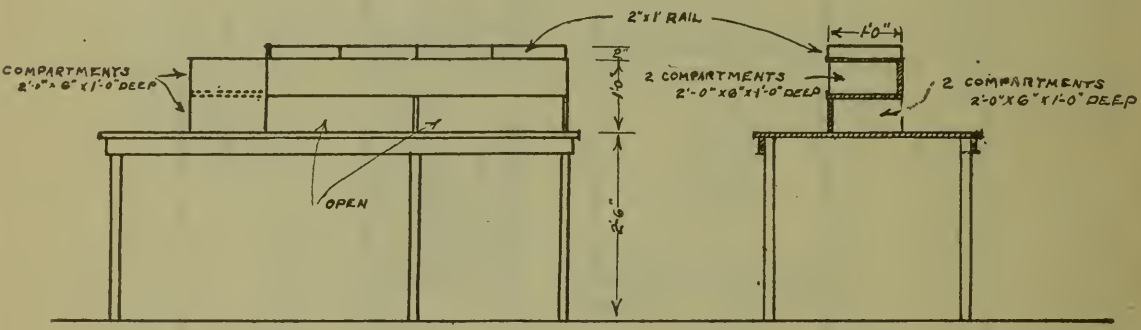


SECTION

ELEVATION

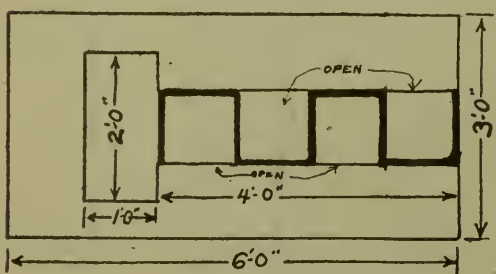
BENCH IN SMALL EXAMINING ROOM

- 10 WANTED 12'6" LONG - 5 SECTIONS
- 10 WANTED 10'0" LONG - 4 SECTIONS



ELEVATION

SECTION



PLAN

TABLE
IN
SCORING ROOM
20 WANTED

Figure 8.

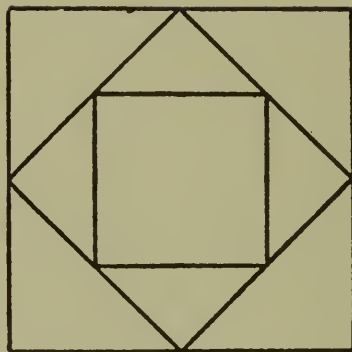
large examining room. The small examining room, or Beta room, was planned to seat between 60 and 100 men. A bench designed for this room, with its partitions and other measurements, is shown in Fig. 8. It was also deemed desirable to have in this room a raised platform, about 18 inches high, from which the demonstrations could be more easily seen from the back of the room. A bank of lights so arranged as to illuminate the Beta blackboard will be found essential on cloudy days. Cross-lights should be avoided. Lights in Alpha room should barely clear the tallest men.

The storeroom should have built-in shelves sufficient to enable the examiner to unpack at least one week's supply of the necessary examining materials. Similar shelves should be planned for the scoring room, record room, office, and small storeroom. Shelves in the record room can be made wider than usual shelving, so that if long, narrow boxes are built to contain the record cards they may be placed lengthwise across these shelves. Other necessary changes are indicated on the plan.

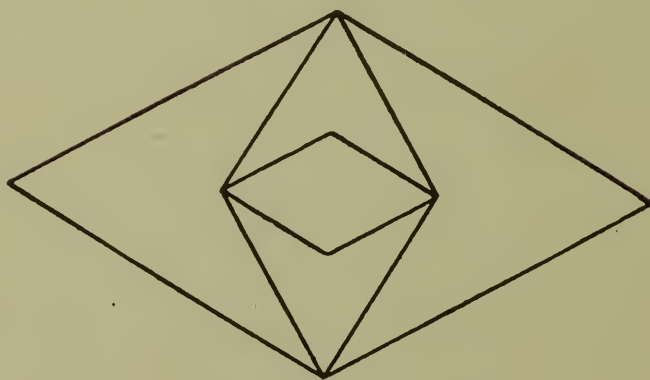
A certain amount of furniture, either built by the construction quartermaster or supplied through the camp quartermaster upon requisition, is indicated in the plan. Examiners should have on hand at least 250 strips of beaver board 12 by 18 inches, wicker mats for the Alpha examining room, if possible, and a sufficient supply of wall hooks for overcoats and hats of those being examined. Each of the individual rooms on the second floor should be supplied with small tables. In addition, about 20 small tables, 3 by 6 feet, 30 inches high, are needed in the scoring room. According to the desire of the examiner, these tables may be supplied with special scoring tops, as indicated in the specifications and plan in Fig. 8. For the regular work of the examining staff and scorers at least 75 ordinary chairs should be sufficient.

This is a brief description of the building and equipment as originally planned for the psychological examining staff. It is obvious that no one of the buildings already constructed can be adapted to meet these suggestions exactly. The original plan and equipment are presented here as suggestions rather than as essential in all details. It is essential that the individual examining be done under as uniform conditions as possible. It is necessary that the chief examiner have a definite address and office within the camp boundaries, and it is further essential that proper storage space be furnished and supplied with locks or guards to protect against loss of examining materials. It is also necessary, for accurate scoring and recording, that permanent and sufficient floor space be supplied for the scoring unit. Outside these essential and necessary requirements and the expendible equipment necessary to carry on the examining, scoring, and recording, physical properties will vary considerably from camp to camp.

Test 6, d. 1, d. 2



d. 2



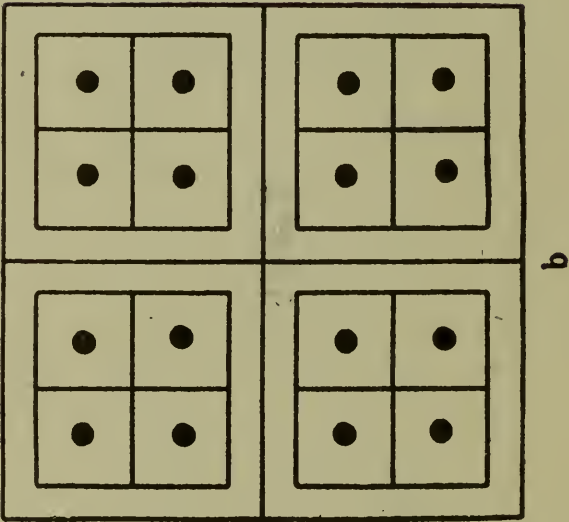
d. 1

Test 6, c. 1, c. 2

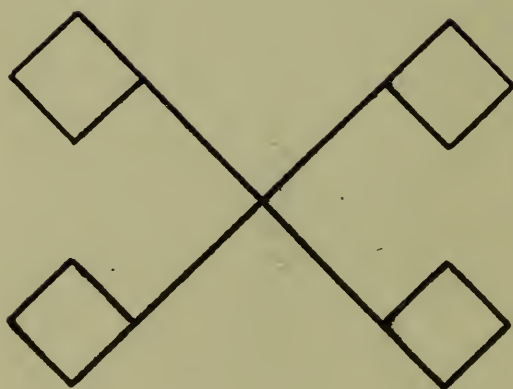
c. 2

c. 1

Test 6 b



Test 6, a



a

Test 6. Demonstration Design

